

Example sentence: War seemed more imminent each day, and families quickly began fleeing the city, worried at what seemed to be the certain desolation to come.

Despoil—Despoil is related to the phrase *the spoils of war*. The spoils of war are the things that invaders would take from the inhabitants upon victory. Pretty much anything of worth would be looted or plundered. To despoil is the act of taking away anything of value.

Example sentence: The greedy criminals broke into the historic mansion to despoil it.

Deter—To deter someone is to stop them from doing something.

Example sentence: The would-be bank robbers were deterred when they saw that security had been increased dramatically.

Disenfranchise—To disenfranchise is to take away someone's right to vote, or prevent them from using it.

Example sentence: For most of human history, women were disenfranchised.

Disparity—A disparity is an inequality or a difference between two things. For instance, there may be a disparity between the posted rules in a classroom and the rules that are actually enforced.

Example sentence: Small children are quick to point out any disparity between the dessert they receive and the dessert their brother or sister receives.

Disseminate—To disseminate is to pass out or to ensure the spread of something (quite often information).

Example sentence: At the end of the security meeting, the participants were asked not to disseminate the knowledge that they had acquired, since doing so could put people in harm's way.

Dissimilar—Things that are dissimilar are not the same (not similar).

Example sentence: While they had grown up in the same house, at the same time, with the same parents, the twins were quite dissimilar.

Diverge—When two things move apart, they diverge. (This is the opposite of when two things come together, which is when they converge.)

Example sentence: Quite often, when students graduate, they diverge from their friends and move on with life.

Doctrine—A doctrine is a sincerely held belief, often of the religious variety, but also political or other beliefs as well.

Example sentence: Some people do not stand for the pledge as it goes against their religious doctrine—this is their right under the First Amendment.

Doldrums—The word doldrums is often used to describe a time in which nothing happens. It is also used in sailing to describe an area of water that is not moving in which a sail boat would be trapped. Doldrums are never a good thing and can sometimes even be used to describe depression, boredom, and other negative mental states.

Example sentence: After his breakup, he entered a period of doldrums which lasted for several weeks.

Domestic—When something is described as domestic, it is related to the home. If someone hires domestic help, they are likely hiring someone to help take care of their house or something in it. It could be a gardener, maid, or cook.

Example sentence: Compared to the other families of 1900, their marriage was unconventional, with her working and bringing home a paycheck while he stayed home and attended to domestic matters.

Dominion—Dominion is control or authority over someone or something.

Example sentence: The king frequently exercised his dominion over the serfs to extract more and more work from them in less and less time.

Dubious—To be dubious is to be doubtful and uncertain.

Example sentence: While my friend was eager to explore the cave, I was much more dubious about doing so.

Earnest—When someone is earnest, they are showing that they are serious. They really believe what they are saying and they find it important that you understand that.

Example sentence: The young man spoke earnestly as he told her of his feelings and tried to convince her to accept his proposal.

Eddy—An eddy is when water or air moves swiftly in a circular motion.

Example sentence: The boat, caught in a persistent eddy, appeared to be lost forever.

Effectual—The word effectual means that the desired result has been achieved through that action.

Example sentence: I have found that asking for help is far more effectual than simply waiting for someone to offer.

Efficacy—The efficacy of something is how effective that thing is.

Example sentence: The efficacy of the treatment came into question when the wound became infected instead of healing.

Efficient—When something is efficient, it is done in the most direct way possible using the least amount of time and resources to get the best result.

Example sentence: Jennifer completed her errands quite efficiently and was back at home just an hour after she had left.

Embellish—To embellish is to add details or flair to something—either verbally or physically.

Example sentence: The seamstress told embellished tales of her youth while embellishing the wedding dress with thousands of tiny pearl beads.

Emit—Emit means to give off.

Example sentence: After having been sprayed by a skunk, the puppy emitted a horrid smell for several days to come.

Empathize—When you empathize with someone, you feel what they're feeling. You might empathize with a friend who had a terrible grade on a test, or with a family who needs some help getting enough food for a holiday meal.

Example sentence: The storm damage to the home caused an outpouring of support from their neighbors, who empathized with the now-struggling family.

Endearing—When people are endearing, they create warm feelings toward themselves. A person may have an endearing smile that makes you like them and feel kindly toward them.

Example sentence: When I joined my new school, I was seated next to a small girl with pigtails. She had the most endearing personality and we were soon great friends.

Endeavor—To endeavor is to try something. It can also be used as a noun, meaning “a try.”

Example sentence: Once the rain stops, we will endeavor to get the garden planted.

Endow—To endow is to give. Quite often, this term is used to describe massive donations given to charities upon the death of a wealthy person. It can also talk about rights given to people just because of their birth or citizenship.

Example sentence: (From the Declaration of Independence) “We hold these truths to be self-evident, that all men are created equal, that they are endowed by their creator with certain unalienable rights, that among these are life, liberty, and the pursuit of happiness.”

Enhance—To enhance something is to make it better or clearer. An umbrella enhances your experience of walking in the rain. Prescription glasses enhance your eyesight.

Example sentence: The coach added a few trick plays to the book in order to enhance our chances of success.

Enterprise—When you set out to do something, the process of doing it is an enterprise. This word often refers to big or difficult tasks. Think about the starship *Enterprise* from Star Trek—it has a very difficult mission: “To explore strange new worlds. To seek out new life and new civilizations. To boldly go where no man has gone before.”

Example sentence: The process of building and moving to a whole new school in just a year was quite a difficult enterprise; however, the school board was committed to it as it was seen as the best option for the students’ education.

Entice—To entice someone is to convince them to do something through the promise of reward (as opposed to coerce, which is through promise of harm). A cat can be enticed to come out from under the bed with a treat.

Example sentence: When the workers dragged their feet getting a project done, the manager enticed them to finish by promising an extra vacation day to whomever completed their portion first.

Entrenched—To be entrenched means to be dug in, to refuse to move, especially when it comes to thoughts and ideas. Think about how armies use trenches. They dig trenches, and then they can’t easily move from the trenches without risking harm. The word entrenched comes from that idea.

Example sentence: Some people believe that debates are essentially useless since both parties often begin the debate already so entrenched in their ideas that they won’t even listen to the other debater.

Ephemeral—Something ephemeral is very short-lived. It is fleeting and quickly gone.

Example sentence: The rainbow—one of the most beautiful natural phenomena—is quite ephemeral and generally disappears within just a few short minutes.

Evince—Evince is generally a verb meaning to show one’s feelings.

Example sentence: The actions of the government as it tries and fails to help time and again evince anger and frustration.

Expenditure—An expenditure is a spending of money or other resources.

Example sentence: Buying all new china was an extravagant expenditure, but the noble felt it was necessary since he would be entertaining a duchess.

Explanatory—When something is explanatory, it explains something.

Example sentence: Quite often, students skip over explanatory examples and jump straight to the work; this is generally a mistake.

Extensive—When something is extensive, it is widespread or far-reaching. You might also say it is thorough.

Example sentence: Due to extensive cheating, the teacher shredded the tests and instead made each student meet with her for an oral examination of their knowledge.

Feature—A feature is a part of an item that is designed for a specific use. One feature of my car, for example, is a stereo system.

Example sentence: I was excited to check out all of the new features on my phone upgrade.

Feeble—To be feeble is to be weak.

Example sentence: The feeble elderly couple often needed their neighbors' help with the landscaping.

Fetter—To fetter is to hold someone or something back from what they want to do or accomplish.

Example sentence: While I love my parents, living under their rules often leaves me feeling fettered.

Finite—Finite is the opposite of infinite. When something is finite, it has a definitive beginning and ending.

Example sentence: The fact that the movie was finite saddened me—I wished it could go on and on forever.

Fiscal—When people describe things as fiscal (like the fiscal year), they are talking about money and the economy.

Example sentence: Because of excessive spending, the business was experiencing fiscal difficulties that threatened to bankrupt it.

Florid—Generally describing a person’s face, this adjective means red or flushed.

Example sentence: Having run the 5K in brutal heat, the athlete rested with his florid face cradled in his hands.

Former—Former refers to the one before or in the past. The former president used to be the president, for example. If I give you two options and you choose the former, then you have chosen the first one that was given.

Example sentence: I was shocked when the former mayor of my town was revealed to be in the middle of a scandal, which plunged the town into a fiscal crisis.

Forum—A forum is a location or a meeting where people can talk about their thoughts, ideas, and opinions.

Example sentence: The teacher rearranged the desks into a circle to facilitate discussion and turn the classroom into a forum on governmental improvements.

Frantic—Frantic could also be expressed as desperate. When you are frantic about something, there is urgency to do all you can as you try to solve the problem.

Example sentence: The dog wandered off during the picnic, triggering a frantic search by all the family members.

Frequent—Frequent simply means often. When something happens frequently, it happens all the time.

Example sentence: His frequent tardiness led to a Saturday detention.

Fundamental—Fundamentals are basics. The fundamentals of reading would be learning the alphabet and phonics. The fundamentals of baseball are throwing, catching, and hitting.

Example sentence: After many in the class failed the math test because they weren't allowed to use calculators, the teacher made them return to fundamentals and practice adding, subtracting, multiplying, and dividing by hand.

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Germinate—To germinate something is to take something with potential and make it start to grow. Quite often this term is used with seeds.

Example sentence: Part of the preschool's mission statement is "to germinate active and curious minds."

Glom—To glom is to attach to something (often in a blob-like manner).

Example sentence: Even despite continual cleaning, the boat was still covered in barnacles, which had glommed on to the hull.

Glut—A glut is a ridiculous abundance of something. It's having so much of something you don't even know what to do with it.

Example sentence: When the flood waters receded, there was a glut of carp left behind, flopping on the streets. The townspeople ate like kings that night and celebrated the day every year after with a Carp Festival.

Grievance—A grievance is a complaint. Think of it as something you would grieve over—something that makes you sad.

Example sentence: After the salesperson was seen taking a picture of my credit card, I felt it necessary to lodge a grievance against him as he was probably planning on stealing my identity.

Haggle—Haggling is the process two people go through as they exchange offers back and forth while trying to make a deal.

Example sentence: One reason I like garage sales so much is the opportunity to haggle with the seller and try to secure a better deal.

Ignominious—Something that is ignominious is undignified—it will likely cause the person experiencing it to feel shame or embarrassment.

Example sentence: My brother pulled the chair out from under me, causing me to sprawl on the ground in a very ignominious position.

Illegible—When something is illegible, it is unable to be read or understood.

Example sentence: With the prevalence of typing these days, many people have illegible handwriting due to lack of practice.

Immured—When someone is immured, they are held against their will in some way, often enclosed.

Example sentence: The young man felt trapped in the relationship, immured by his desire not to hurt her feelings.

Impel—To impel is to push or force someone to do something in some way.

Example sentence: Impelled by the fear of loneliness, many people resort to blind dates to try to find a companion.

Inapplicable—When something doesn't apply in a given situation, it is inapplicable. For example, you may have the quadratic equation memorized, which is great; however, that equation is inapplicable to many non-quadratic math problems.

Example sentence: While she had many skills, most of them were inapplicable to the current crisis; she would have to call for help.

Incomprehensible—Something that is incomprehensible is unable to be comprehended or understood.

Example sentence: The student's illegible handwriting and incomprehensible train of thought resulted in a very low grade on the essay.

Incontestable—Incontestable means unable to be contested. In other words, you can't dispute it or go against it.

Example sentence: The results of the election were incontestable; the candidate won by a landslide.

Incorporate—To incorporate is to fully include something. For example, you might incorporate an explanation of climate change into a paper on Antarctica.

Example sentence: The leader was harshly criticized when the press found out that he had failed to incorporate any women into the task force on family and children's rights.

Incredulous—When you're incredulous of something, you don't really believe it, or you have doubts about it.

Example sentence: The child looked at her friend incredulously when she tried to convince her that the monster was, in fact, not real.

Indifference—Indifference is that feeling of not feeling strongly about something one way or the other. You might feel indifference toward which teacher you get, or what you have for lunch, or any number of things.

Example sentence: Indifference is a dangerous emotion as it can lead to people drifting through life and never taking any risks or making any big decisions.

Indistinguishable—When two things are indistinguishable, they can't be told apart from one another: There are no distinguishing features.

Example sentence: Even though their mother could tell them apart, to everyone else the twins were indistinguishable.

Ineffective—When something is ineffective, it doesn't work. It doesn't have the effect it should.

Example sentence: Flushing ice cubes down the toilet is an ineffective strategy that kids try to ensure a snow day the next morning.

Inefficacious—This is pretty much the same as the previous word. Inefficacious just means not having the desired effect.

Example sentence: Studying can be inefficacious if you don't make sure to get rid of all distractions before beginning.

Inexorable—Inexorable is kind of like inevitable. It can't be avoided or stopped—it will occur no matter what.

Example sentence: The clock had been ticking constantly for the entire winter, counting out the inexorable passage of time.

Ingenious—For some reason, ingenious and genius mean the same thing.

Example sentence: The pirate queen was known for her ingenious plots to capture other ships.

Innumerable—When something is innumerable, it is unable to be counted. You'll notice *num* hidden away—this is also the root of the word number.

Example sentence: The grains of sand on the beach are truly innumerable.

Institution—An institution is an organization that has been created to fulfill a purpose (generally for the greater good). For example, governments, churches, and schools can all be examples of institutions. Generally, institutions are thought of as permanent or nearly impossible to get rid of.

Example sentence: Between churches, schools, and my mom's job as our small-town mayor, I often feel like I grew up in institutions.

Insurrection—An insurrection is a revolt or an uprising.

Example sentence: Though Catherine the Great is revered by Russians, the peasant insurrection during her time as ruler put a damper on her legacy.

Integrate—To integrate two or more things is to mix them together.

Example sentence: I don't remember the exact date, but at some point in seventh grade, the girls' lunch tables and the boys' lunch tables started to integrate and nothing was ever the same again.

Intend—Intend has to do with intentions. It’s what you mean to do, not what you actually do. Every new year, many people intend to form new habits; what actually happens is a different story.

Example sentence: In the evenings, I always intend to get up early the next morning to increase my productivity. This rarely actually happens.

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Intermittent—Intermittent just means off and on at a set interval.

Example sentence: The stoplight let cars proceed intermittently.

Intuitive—When something is intuitive, it is easy to use and figure out without directions. You can go based on your gut feeling and probably get it right.

Example sentence: While some people struggle to memorize math facts, other people find numbers to be intuitive and breeze through their classes.

Inherent—When something is inherent, it wasn’t learned or created; it is naturally occurring. For example, some animals have an inherent fear of predators. You may have an inherent love of the color green or hatred of the smell of tomatoes.

Example sentence: As hard as they tried, my neighbors could not train their dog out of his inherent desire to dig holes.

Insolent—You might well get in trouble for acting insolent at school. Such behavior shows a general bad attitude, lack of respect, and overall grumpiness.

Example sentence: “Wouldn’t you like to know,” came the insolent reply from the teen when her father asked her why she had returned so late the night before.

Intolerable—When something is intolerable, you simply can’t put up with (or tolerate) it.

Example sentence: “Your behavior is intolerable,” her father responded before he grounded her.

Invasive—Think of the word invade. When something is invasive, it invades something or goes somewhere it isn't wanted.

Example sentence: Family get-togethers are always difficult since my great aunt likes to gossip; she goes around asking everyone highly invasive questions.

Inversion—To invert something is to turn it upside down. An inversion is the noun form of that word and means the act of turning upside down.

Example sentence: The scariest roller coaster in the park had the fastest speeds, the highest hills, and the most inversions.

Irk—When something irks you, it annoys you, but not in a major way. Someone leaving a dirty dish out, taking the middle piece of cake, not using their turn signal in traffic, or failing to do what they promised may irk you.

Example sentence: I was very irked when the teacher changed the assignment. While there was still plenty of time before the due date, I had already begun the research and had to change course due to the adjustments.

Labyrinth—Quite simply, a labyrinth is a maze.

Example sentence: Moving from a small family firm to a giant corporation was a big change, and I often found myself lost in the labyrinth of cubicles.

Laden—To be laden is to be weighed down with something physically. A shopping cart might be laden with groceries, for instance.

Example sentence: The mailman dreaded the holiday season when his bag became quite cumbersome to carry, laden as it was with packages full of presents.

Latter—Latter is the opposite of former. Former is the first thing mentioned, latter is the second or last.

Example sentence: I was given the option of either getting out of bed for school or getting grounded, and I foolishly choose the latter, which left me trapped at home over homecoming weekend.

Liaison—This is often used to mean a close connection or relationship. It can also mean a person who facilitates understanding between parties.

Example sentence: In the office, it was often my job to be a liaison between various parties.

Magnitude—The magnitude of something is how big it is.

Example sentence: My coworker seemed to have her head buried in the sand and didn't realize the magnitude of losing our biggest client.

Malice—Malice (*mal* at the beginning of the word means bad) is generally used to describe the feeling of one person wishing to do something harmful to another person.

Example sentence: It was a long-standing rivalry, and the malice off the field lead to overly aggressive behavior on the field, which resulted in the game being ended at halftime.

Malign—To malign someone is to say terrible things about them.

Example sentence: After he got a bad grade, he proceeded to malign the teacher to anyone who would listen.

Manifest—This can mean a variety of things. As a noun, it is a complete list. As a verb, it means to make appear or to make clear. As an adjective, it means obvious or clear.

Example sentence: The passenger manifest manifested to the detective the fact that the sought-after party was not on board the ship.

Manipulate—To manipulate something or someone is to change them to your liking. You might manipulate your parent's opinion on where to eat by casually mentioning pizza several times during the day. You might also manipulate clay into the shape of a vase.

Example sentence: While many people believe that data don't lie, in reality, data can be heavily manipulated to show just about whatever results are desired.

Mantra—A mantra is something that people repeat over and over to themselves in the hopes that it becomes true or as a means toward achieving a goal.

Example sentence: In the early days of January, people who appear to be just going about life are silently repeating their mantras in the hopes of fulfilling their New Years' resolutions.

Marginalize—This word refers to the action of making something less, often when it shouldn't be. A person's feelings may be marginalized or brushed away as not important.

Example sentence: The young girl always felt marginalized when her successful older siblings were around.

Meander—To meander is to wander in a non-straight line and with little or no haste or purpose.

Example sentence: If I get bored this afternoon, I may meander over to the park to see if anything is going on.

Mechanization—Mechanization is when something that used to be done by hand is now done by a machine.

Example sentence: Mechanization has caused great concern in the auto industry lately as workers have been laid off and their jobs replaced by robots.

Meddle—To meddle is to tamper with something, often human situations or emotions.

Example sentence: When my two best friends broke up, I tried to help them fix their relationship, but I only ended up making it worse. As my mom often says, "Meddling does no one any good."

Metastasize—When something metastasizes, it is spreading.

Example sentence: Luckily, the disease had been found before it metastasized, and so it appeared as if recovery were very likely.

Mire—To mire is to stick something down. When someone or something is mired, it can't be freed, but is stuck in a sticky situation either figuratively or literally.

Example sentence: I always cry during my favorite childhood book when the horse becomes mired in a bog and must be abandoned so that the quest can be completed.

Monotony—Monotony is the same thing over and over again.

Example sentence: As the semester progressed, I felt trapped in a scholastic monotony with nothing ever changing, each day exactly the same as the last.

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Motivation—Motivation is what drives you. It's the feeling inside that makes you start that project, run that extra mile, or take the extra shift.

Example sentence: Since motivation was low, the teacher promised extra credit to the first student who turned in an "A"-worthy project.

Mundane—Something that is mundane is boring and normal. It's a regular everyday occurrence.

Example sentence: Until the fire alarms went off, it had just been a mundane Monday morning.

Mutable—Think about the math term permutation. A permutation has to do with all the different ways a set of numbers can be changed and rearranged into different orders. That root word *mut* generally has to do with change. Mutable describes something that is easy to or likely to change. Other words you might know with this root include mutate and commute.

Example sentence: The speaker was worried he would be unable to change the audience's minds, but it turned out they were much more mutable than he had anticipated.

Mystify—To mystify just means to confuse. Think about the word mystery with the same root. A mystery is confusing—mystifying someone confuses

them.

Example sentence: The scientists were mystified at first as to the meaning of the data that they had collected.

Net—In describing pay, net pay is what is left after all taxes and fees are removed. In scientific terms, it could be what is left after all other considerations are removed. For example, when you weigh something and you remove the weight of the container, you are left with the net weight of what is in the container.

Example sentence: The charity race raised a net total of \$3,500 after the administrative expenses and permit fees were paid out.

Notation—You know the word note; what you probably didn't realize is that it's a shortened version of notation. It's something you write to help you remember something or to convey information to another person.

Example sentence: By the time I bought the textbook, it had already had several other owners and the margins were filled with notations—some helpful, others decidedly not.

Nuance—A nuance is a subtle difference in the meaning or expression of something.

Example sentence: While the applicants responded to the question in a similar way, the nuances in their reactions helped the manager make a decision as to who would be a better fit for the job.

Null—Null means nothing; it's just another way of saying zero.

Example sentence: When the parties pass away, the contract becomes null and void.

Obliterate—To obliterate something is to completely and utterly destroy it beyond recognition.

Example sentence: The meteor obliterated the forest into which it crashed, scattering debris all over the countryside.

Obstinate—Obstinate is just the same as stubborn. It means refusing to give up even when wrong or faced with insurmountable forces against you.

Example sentence: Despite pleading, cajoling, and coercing, the young child obstinately refused to get in the bathtub.

Oscillate—To oscillate is to move back and forth in a predictable pattern at a set speed. The pendulum in a grandfather clock is a classic example of oscillation.

Example sentence: The oscillation of the carnival ride made me sick to my stomach.

Onerous—When something is onerous it is difficult to do, usually taking a lot of unpleasant work to complete.

Example sentence: As a veterinarian, I often have the onerous task of discussing expensive bills with clients.

Panacea—A panacea is a fix-all solution.

Example sentence: While most people view love as a panacea, I know from experience that it can't solve all problems.

Parasitic—Something that is parasitic attaches to something else and feeds off of it without giving anything back. This might be used to describe an actual parasite (like a tapeworm) or a person like the friend who always borrows money, but never returns it.

Example sentence: When one person would get wise to her parasitic ways, she would merely find someone else to leach the homework off of for the next few weeks.

Parity—Parity is equalness or being equal. It is the opposite of disparity, which is inequality.

Example sentence: Despite the parent's best efforts at parity, one of the children always felt that they had received less attention.

Paradox—A paradox is something that contradicts itself or sets up an impossible train of thought that never ends but always circles back on itself.

Example sentence: One of the most well-known paradoxes is the statement, “This statement is false.”

Partake—To partake is the same as to participate. It is often used with food (to partake in a meal is to eat it) but can also be used with any given activity.

Example sentence: Even though I always insist I’m not hungry, my grandmother won’t let me leave her home without partaking in at least one meal or snack with her and my grandfather.

Paternal—To be paternal is to act in a fatherly way. Paternal can also be used to describe things relating to fathers.

Example sentence: Even though I barely knew him, the old man acted in quite a paternal way to me and insisted on seeing me home safely when I became lost.

Permeate—To permeate is to soak through something, invading and saturating every part of it and leaving nothing untouched. Water permeates things in a flood, and smells permeate rooms and homes.

Example sentence: The smell of burned food permeated the kitchen as the family rushed to save their dinner.

Permutation—Remember the word mutable from above? Permutation has that same *mut* syllable indicating it’s about change. Permutation has to do with all the different ways a set of items can be arranged in different orders. In how many ways can the order be changed?

Example sentence: In math class, the teacher explained permutations to us by making ten students line up in as many different ways as possible; the possibilities seemed endless.

Perpetual—Something that is perpetual is never-ending.

Example sentence: Life in the Arctic Circle is very difficult in the winter when whole communities are plunged into perpetual darkness for months on end.

Perspective—Your perspective is how you see things both literally (different seats in a theater have different perspectives of the stage) and figuratively (you and your parent may have different perspectives on your staying up until 3 A.M.).

Example sentence: Since he was the only young person in the office, he was often called into meetings to give a different perspective on various issues.

Perturb—To perturb is to disturb, but in an emotional way. A scary book or a strange person may perturb.

Example sentence: The teacher was quite perturbed by the actions of the small child, which were very out of character for a four-year-old.

Pervading—Pervading or pervade are often used as synonyms for permeate. Something (especially a smell) can be pervading when it permeates an area where it is not welcome.

Example sentence: The pervading smell was quite offensive to the students, who quickly jumped to open the windows.

Phenomena—Phenomena is the plural of the word phenomenon. A phenomenon is something that is known to exist or occur, the cause of which is often not clear. Planes going down in the Bermuda triangle is a well-known phenomenon.

Example sentence: A great crowd gathered to watch the strange phenomenon.

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Pittance—A pittance is a pitifully small amount: not really enough to do anything with.

Example sentence: With her children and husband all gone, the widow somehow managed to live off the pittance given to her by neighborhood charities.

Plasticity—The plasticity of something is its ability to change and be molded.

Example sentence: The best time to learn a foreign language is when you're young; that's when you still have the most brain plasticity.

Plenipotentiary—A plenipotentiary is a person who has been given the authority to act on behalf of their country in foreign countries. Diplomats often act in this role, though true plenipotentiary power is rare.

Example sentence: During negotiations with France, Benjamin Franklin acted as a plenipotentiary for the United States.

Posterity—Posterity is the future of humankind: all of the people who will come in the future.

Example sentence: The collection of American historical artifacts at the museum is being carefully preserved for posterity.

Postulate—To postulate is to guess or to present an idea that is not proven. A TV personality may postulate that a certain person will be elected.

Example sentence: "Maybe there is a traffic jam," she postulated as she waited for her date who was very late.

Potent—Potent means very strong. Not physically, but of a high concentration. A smell or taste, for example, may be very potent.

Example sentence: As the potent fumes wafted through the laboratory, the alarms sounded to warn all the scientists to evacuate quickly.

Prattle—To prattle is to talk on and on while saying little of value.

Example sentence: Faced with an abundance of awkward silences, the young lady prattled endlessly to avoid the quiet.

Predecessor—The predecessor to something or someone is what came before. This word is often used to describe a person who held an office or job prior to the current office or job holder.

Example sentence: "My predecessor may have allowed talking in class, but I do not," the new teacher informed her students.

Preposterous—Something that is preposterous is so ridiculous as to be laughable.

Example sentence: The elderly man laughed and said “don’t be preposterous,” when his grandson suggested that he try the mechanical bull at the fair.

Primitive—Something that is primitive is very basic and not technologically advanced. For example, some might see flag signaling as a primitive form of long-distance communication.

Example sentence: Primitive computers took up whole buildings and had less computing power than the average flip phone does today.

Pristine—Something that is pristine is untouched and perfect. It is completely unmarred in any way.

Example sentence: One of my favorite sights is a field of pristine snow, untrampled by any animals or humans.

Proliferate—To proliferate is to grow, spread, and reproduce, often at a high rate of speed. Rumors tend to proliferate within schools, as do germs.

Example sentence: The weeds proliferated throughout the summer, and he quickly realized that having a pristine garden was impossible.

Promulgate—To promulgate an idea is to spread it around. There are a lot of programs, for example, that promulgate anti-bullying messages to students.

Example sentence: The man was asked to leave the gathering when he was heard to be promulgating his latest get-rich-quick scheme.

Province—A province is a geographical area under a government. Many countries have a province system instead of having states.

Example sentence: As a Canadian, I often simply respond with my province when Americans ask what state I’m from.

Proxy—A proxy is a substitute. A person standing in for another person can generally be called a proxy. In some situations, formal events like

voting, getting married, and signing contracts can be done by proxy.

Example sentence: Since the CEO was incredibly busy that day, he had his assistant attend the board meeting to vote as his proxy.

Psychological—Things that are psychological have to do with the inner workings of our minds, which affect our feelings, emotions, and actions.

Example sentence: The doctor, having run out of tests to perform, came to the conclusion that the symptoms must have psychological causes.

Quarrel—To quarrel is to argue with someone. A quarrel is an argument.

Example sentence: The young nanny was constantly begging the children not to quarrel.

Rapacious—Someone who is rapacious is unable to be satisfied. They are very greedy and always looking to gain more of what they want.

Example sentence: The rapacious vultures searched for food all over the meadow.

Receptive—A person who is receptive is open to receiving things, quite often ideas.

Example sentence: While the student was nervous about asking to take the test again, the teacher was quite receptive to the idea.

Redress—Don't get tricked into thinking this word means to get dressed again. Instead, it means to fix or make a situation right where someone has been wronged.

Example sentence: The man who had been wrongfully imprisoned sought redress for his grievances.

Reluctant—To be reluctant is to act on the feeling of not wanting to do something. If you end up doing the thing, you do it in a manner that shows that you don't want to be doing it.

Example sentence: The teacher was reluctant to give up his Saturday to grade papers, but the students had already waited a week, so he sat down

with his red pen and got started.

Remonstrate—To remonstrate is to object to something strongly or to speak out against something strongly.

Example sentence: The principal remonstrated the student's misbehavior.

Repression—Repression is the act of holding something down or back, especially ideas and movements.

Example sentence: The governmental repression of revolutionary societies became stronger each week.

Reverence—Reverence means showing great respect or a deep appreciation for something.

Example sentence: When entering the throne room, it is always necessary to show reverence for the king by bowing before him and kissing his ring.

Rhetoric—Rhetoric is the way in which people speak and argue to convey their points. Different people may have different styles of rhetoric: They may ask questions, they may use persuasive language, they may yell, they may trick. All of those are types of rhetoric.

Example sentence: The country quickly got tired of the candidates' loud rhetorical blustering.

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Sanction—Sanction is a very interesting word as it has seemingly opposite meanings. Make sure you pay very close attention to the context.

Sometimes sanction refers to officially approving or allowing something to happen. The school might sanction a dance, meaning it's officially approved by the administration. However, sanctions can also be negative—a penalty for something done that is bad. Usually the context of negative sanctions is legal; when the word is used in this manner, it often refers to one country placing sanctions on another country for things like human rights violations.

Example sentence: “Just know that I do not sanction this event,” said the mayor when the town council voted to have the festival against her wishes.

Scuttling—Scuttling is a very specific type of movement. It's moving very quickly with tiny (often not smooth) steps. Think about how crabs may run along a beach—they're almost always scuttling.

Example sentence: The pickpocket checked over his shoulder one more time before scuttling down an alley with his ill-gotten gains.

Scenario—A scenario is the setup for a work of fiction, a book, movie, or play. It can also be any imagined situation that people put themselves in, such as discussing what could happen in the future or things that should have happened in the past.

Example sentence: My English teacher proposed an interesting scenario—what books would you take with you if you were stuck on a deserted island?

Seamless—Think of a shirt without seams—it's completely smooth and has no breaks in the fabric. When something is seamless, it is very smooth. This word is often used as a synonym for flawless.

Example sentence: The director was thrilled when the whole production came together seamlessly.

Sentiment—A sentiment is how you feel or what you say about something that has occurred.

Example sentence: While he expressed nice sentiments about being sorry, she couldn't bring herself to forgive his mistakes.

Sentinel—A sentinel is a soldier whose job it is to keep watch over something.

Example sentence: The sentinel rushed to the general with news of invaders.

Sequence—A sequence is the order that things are in or the order that they should be in.

Example sentence: The librarian got very upset when she found out that her assistant was shelving books in the wrong sequence.

Shingled—Something described as shingled would have the same layered look as the shingles on a roof.

Example sentence: As odd as it looked, shingled hair was quite popular in the early 2000s.

Skeptic—A skeptic is someone who is skeptical, or doubtful, of something.

Example sentence: Jack continued to power forward with his extravagant plans, despite the loud voices of his skeptics.

Sluggish—When described as sluggish, things are slow or moving like a slug.

Example sentence: I'm incredibly sluggish if I don't have any coffee in the morning.

Squalid—When described as squalid, things are run down, dirty, and often infested with vermin. This is often the result of war or poverty.

Example sentence: Despite her best efforts at fixing and cleaning, the apartment remained at best squalid and at worst unlivable.

Squelch—Squelch is an onomatopoeia; the word means the sound it makes. Squelch is the sound that might be made if you tried to pull your foot out of thick mud or if you stepped on a slug.

Example sentence: With soaking wet socks and shoes, every step squelched.

Stagnate—To stagnate is to stop moving forward. This is generally not physical movement.

Example sentence: The project had stagnated, which caused great concern with the management team.

Stewardship—A steward is someone who takes care of something. Stewardship, then, is the noun form of the act of taking care of something.

Example sentence: As the result of careful stewardship, the manor survived the 50 years of being boarded up with only a bit of dust to tell of the long emptiness.

Stupefied—To be stupefied is to be made temporarily stupid. This generally happens if something really sudden or unexpected occurs.

Example sentence: After witnessing the last-minute heartbreaking loss, many fans left the stadium with stupefied looks on their faces.

Subjugate—To subjugate a person or group of people is to put them under your total control. This is especially applicable in war-time situations when entire populations are conquered and subjugated.

Example sentence: The hero rode gallantly into town, determined to free the subjugated people.

Subordinate—Someone who is subordinate is lower in status, usually in a workplace. A worker is subordinate to the boss.

Example sentence: The hallmark of a good manager is when they treat their subordinates with care, kindness, and fairness.

Subsequent—Something that is subsequent comes after something else. For example, my birthday is subsequent to that of my older sibling.

Example sentence: After getting a D on the midterm, he resolved to study harder for any subsequent tests.

Substantial—When something is substantial, it is not insignificant, but almost the opposite. It is of an important size or amount.

Example sentence: The restaurant lost a substantial amount of money when it changed management.

Sufficient—When something is described as sufficient, it means that it is enough.

Example sentence: While I was doubtful that we'd have enough food to feed everyone, it ended up being a sufficient amount.

Supplemental—Something that is supplemental adds something unnecessary, but helpful, to something else. There may be supplemental information at the end of a chapter. A family may pay for a vacation with supplemental income from a part-time job.

Example sentence: The supplemental assistance from neighbors helped the family through tough times.

Sustenance—Sustenance is what sustains a person. Generally, this is used as a fancy word for food.

Example sentence: After having been shipwrecked for months, the sailors craved sustenance other than dried fish and leaves.

Swayed—To sway is to move slightly back and forth. However, this term can be used figuratively as well as literally. In an argument, you may have swayed your opponent. They didn't actually move back and forth, but maybe their opinions moved slightly.

Example sentence: As the boat swayed, I felt my stomach turn.

Symmetric—Something that is symmetric is the same on both sides. For example, if a person has a symmetrical face, then the left and right sides of their face would be identical.

Example sentence: By very definition, all circles must be symmetric in all directions.

Synthetic—Something that is synthetic is made artificially, not naturally.

Example sentence: Clothing made from synthetic material may last longer, but it also tends to breathe less, causing sweat, smells, and acne.

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Sullen—To be sullen is to be grumpy and unenthusiastic. It is a type of bad mood wherein you do things only under protest. You might think of it as being related to sulking.

Example sentence: The sullen young man was often reprimanded by his mother for his bad attitude.

Tactile—Something that is tactile has to do with the sense of touch. A tactile sensation, for example, is a sensation of being touched in some way.

Example sentence: When I was young, I had a tactile disorder whereby the feeling of grass and other things against my skin caused me great distress.

Tangible—Something that is tangible can be seen and touched (as compared to the opposite intangible).

Example sentence: The tangible benefit of saving for retirement is obviously the money; the intangible benefit is peace of mind.

Tedious—Something that is tedious is repetitive and boring. It takes a long time and doesn't engage the mind.

Example sentence: The tedious task of hand stitching clothing is thankfully no longer necessary due to the advent of the sewing machine.

Tout—To tout is to aggressively try to sell something, to sing its praises to get someone to buy it.

Example sentence: I left quickly when I discovered the so-called party was just an excuse for the hostess to tout her overpriced essential oils.

Transaction—When something is a transaction, it has something to do with the purchase or exchange of goods or services.

Example sentence: The person she thought was her friend was really just interested in a transactional relationship.

Transit—To transit is to move from one place to another. As a noun, transit can also refer to a network of public busses, trains, and streetcars.

Example sentence: Since her car had broken down, she found it necessary to take public transit to work for a few weeks.

Traipsing—When one is traipsing, they are coming and going or moving in a carefree manner.

Example sentence: He finally had to put a stop to the children traipsing in and out of the house with their shoes covered in mud.

Tributary—A tributary is a stream or river upstream that feeds into a bigger river.

Example sentence: The Ohio River, while large, is just a tributary of the mighty Mississippi River.

Ubiquitous—When something is ubiquitous, it is found everywhere. It is common.

Example sentence: The flags were ubiquitous in the highly patriotic town.

Unassuming—When something or someone is unassuming, they are unthreatening and down to earth.

Example sentence: Everyone liked the high school principal. His unassuming nature made him easy to work with.

Unrequited—When feelings are unrequited, they are not returned in kind. This word is often used to describe one-sided love.

Example sentence: Driven mad by unrequited love, the story's heroine wandered the moors for the rest of her life and haunted her beloved after her death.

Unseemly—Something that is unseemly might otherwise be described as inappropriate for the situation.

Example sentence: While appropriate for milking cows, overalls are an unseemly choice for a fine French restaurant.

Unstinting—Something that is unstinting is given without pause or second thought.

Example sentence: My favorite teacher gave me unstinting support in my quest for academic excellence.

Unveil—To unveil is to reveal. Think of a bride walking down the aisle wearing her veil and then removing her veil to reveal her face to the groom.

Example sentence: The excitement was noticeable as the crowd waited for the mayor to unveil the new city monument.

Usurp—To usurp is to overthrow. This word is often used to discuss overthrowing governments and other authorities.

Example sentence: It is the duty of several agencies to find and arrest anyone who intends to usurp the government.

Validate—To validate something is to say that it is valid, true, or accurate. Quite often, businesses will validate parking. That is, they'll stamp the parking ticket to indicate that the person who parked had a true reason to be there.

Example sentence: Though the woman claimed that she owned the house, her words needed to be validated by calling the local public records office.

Vantage—Vantage is a spot with a good view to see what needs to be seen.

Example sentence: From their vantage point on the second story, they could see the whole parade while staying nice and warm.

Verifiable—Something that is verifiable is able to be verified, or proven correct. Facts are generally verifiable while opinions are not.

Example sentence: His alibi was not verifiable and so he was left on the list of suspects.

Vernacular—The vernacular is the common or slang terms that people in a given community use.

Example sentence: While parents might think it's rude or confusing, most students have vernacular terms that they and their friends use frequently.

Versatile—Something that is versatile can be used in many different ways.

Example sentence: Anytime you go camping you should take a good length of cord. It's a versatile tool that can help in many dangerous situations.

Vestigial—Something that is vestigial is a small left-behind part of something much bigger.

Example sentence: The one standing hut was the vestigial remains of a once-mighty empire.

Virtuous—Something that is virtuous has virtue, or a high sense of morality.

Example sentence: The virtuous young people refused to take part in the cheating ring that was quickly growing at their school.

Wayside—The wayside is exactly what it sounds like, the side of the road. This term is also often used in a figurative sense.

Example sentence: It is often a sad fact of life that when someone begins dating, their friends are pushed to the wayside.

Yearning—Yearning is to want something with all your heart. To crave it at the expense of all else.

Example sentence: Although the young man liked his hometown, he felt a sense of yearning for international travel.

PART 4
Writing



Writing for the Digital SAT

Introduction and Strategies

What Is Tested on the SAT Writing?

When you write in academic settings and in your future career, you will need to use correct grammar, proper wording, logical organization, and persuasive evidence. The SAT Writing tests your skill in determining which choices lead to the highest quality essays. In addition to your knowledge of specific grammar rules, a broad understanding of written English will ensure you do your very best on this section. When in doubt about your approach to the SAT Writing, keep in mind that if you are using the same skills that would be effective in editing a paper, you are likely doing things the right way.

How Is the SAT Writing Structured?

- Part of the Reading and Writing Section (two modules of 27 questions each, 32 minutes each)
- The first Reading and Writing module will be of standard difficulty, and the second module will be more or less difficult depending on your performance on the first module.
- Approximately 25 of the 54 total Reading and Writing questions are Writing ones.
- Out of these 25 questions, about 14 relate to Standard English Conventions and about 11 relate to the Expression of Ideas.
- The writing questions come after the reading questions in a module.

SAT Writing Dos and Don'ts

Do use the full amount of time available. As you probably know from having to edit papers for school, good editing takes time. Take approximately 70 seconds to complete each of the Writing questions. Some of the writing questions may take less time than some of the reading questions, so allocate any extra time from writing questions to the earlier reading questions. When you evaluate more complicated Writing questions, you can make notes on the provided scrap paper so that you fully understand what the question is asking.

Don't rush and make careless errors. Students are usually aware when they have difficulty with a Math or Reading question. With SAT Writing questions, it is easy to *think* you are doing great but to actually make a careless mistake. If you are still finishing the Reading and Writing section with quite a bit of time left, you may want to slow down to be sure you are getting all of the needed information and you fully understand the question that is being asked. This is a better use of time than having a few minutes at the end of the section to just sit there.

› Example

The Roseto Effect is a concept that has expanded scientists' understanding of the effect of mental health on physical health. It has been found that there are some areas in which certain conditions, such as heart disease, are much less common. Scientists believe this may be due to the feeling of connectedness in the community contributing to greater mental health and thus positively _____ physical health.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) influenced
- (B) influencing
- (C) has influence
- (D) had influenced

If you rush through a question like this, you will most likely make a careless mistake. The final sentence of the text says that the feeling of connectedness in the community “contributing” to greater mental health. In order to maintain a parallel structure with the “ing” ending, the only acceptable option would be (B). “Contributing” and “influencing” will maintain parallelism. Choices (A), (C), and (D) all change the verb structure such that a parallel style is not maintained. If you rush through a question like this, you might think you are in good shape, when in fact you missed a detail essential to correctly answering the question.

Do look at enough context. In general, be sure to read the entirety of the given text. If you have any doubt about whether you have sufficient context to make a decision, reread the context of the text just to be sure.

Don’t only consider part of a sentence. It is easy to jump to an answer based on just a small part of a sentence. Keep an open mind as you read the entirety of a sentence. If you have difficulty with jumping to answers too quickly, try covering up the answer choices until you have carefully considered the relevant context.

► Example

Marquis went to his _____ house—he was eager to visit with both his mother and father.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) parent’s
- (B) parents
- (C) parenting
- (D) parents’

Unless you consider the information later in the sentence, you will have insufficient context to determine the correct option. The second part of the sentence states that Marquis was going to meet with “both his mother and

father.” This clarifies that he was meeting with both parents, and it is reasonable to infer that his mother and father shared the house. So, since there are two parents, show possession by putting an apostrophe *after* the *s* as found in choice (D). Choice (A) would work if you had a singular parent. Choice (B) would work if you were using *parents* as a noun instead of using the word to show possession. And choice (C) would suggest that Marquis is going to some house where he does his own parenting, which is inconsistent with the later part of the sentence.

Do mouth out the text as you read it. One of the best strategies for editing a paper is to read it out loud in your head—that way, you will pick up on all sorts of errors that you would miss if you only quickly scanned your paper. Many of the correct answers on the SAT Writing can be found based on how things sound. In particular, punctuation, proper verb use, and parallel structure all lend themselves well to analysis through hearing. When taking the SAT, your job is not to go in front of a class and precisely explain the grammatical justification for an answer. Instead, you simply need to arrive at the correct answer by any means necessary, including trusting your hearing.

Don’t overly rely on intuition—know the rules. While hearing the passage can be extremely helpful, use this approach to *supplement* rather than *replace* careful analysis based on grammar knowledge. Many potential grammar issues—like advanced punctuation concepts and subject-verb agreement—won’t be clear unless you understand the underlying grammar concepts. Fortunately, this book comprehensively reviews the grammar you need to know.

► Example

Teacher letters of recommendation are a key component of a college _____. _____ is important for students to develop good relationships with their educators.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) application; accordingly, it
- (B) application, accordingly, it
- (C) application; accordingly it
- (D) application accordingly, it

Mouthing this out can help you determine where natural pauses are needed. First, a pause is needed between the two independent clauses (complete sentences)—after “application” and before “accordingly.” Second, a pause is needed after “accordingly,” since it is an introductory word before the second independent clause. This intuitive knowledge will only get you so far. It is important to know that a comma cannot join two independent clauses together unless it has a conjunction like *for*, *and*, or *but* along with it. Also, conjunctive adverbs like “accordingly” must have a semicolon precede them when they are used to join two independent clauses. So, the correct answer is choice (A) since it has a semicolon to separate the two independent clauses and a comma to separate the introductory word “accordingly” from the following independent clause. Intuition and grammar knowledge together make for an unstoppable combination on the SAT Writing questions.

Do use the choices to help clarify your thinking. The choices can help you see where a question is headed—look at what is different among the choices to determine what concept is being evaluated. If the choices use different verbs, watch out for subject-verb agreement. If the choices use different punctuation, watch for independent and dependent clauses. And if the choices have different lengths, watch for wordiness. Also, if two or more choices mean essentially the same thing, that is a clue that it will not be those options. For example, since both a semicolon and a period can be used to separate two independent clauses, if you see two options that only differ in that one uses a period and one uses a semicolon, it is likely *neither* of the options.

Don't jump to a choice too quickly. Keep an open mind as you review the choices. Be sure you have considered what the question is asking, what the surrounding context says, and what the subtle differences among the choices entail. Do not treat the SAT Writing questions like ones found on a

recall test you may find in school, in which you can quickly remember the answer from class. Instead, take your time.

► Example

I stayed up late last night studying for my test. _____ I am rather tired this morning. I am afraid my test results will not reflect my true knowledge of the material.

Which choice completes the text with the most logical transition?

- (A) However,
- (B) In contrast,
- (C) Additionally,
- (D) Consequently,

The primary way you should attack this problem is to consider the logical relationship between what comes before the transitional word and what comes after it. The sentence before says that the narrator stayed up late studying for a test, and the part after says that the narrator is now rather tired. A transition that expresses a cause-and-effect relationship would be best, since it is because the narrator stayed up late that now the narrator is tired. “Consequently” in choice **(D)** signifies a cause-and-effect relationship, and it is correct. In addition to attacking the problem this way, you can look at the choices to see what clues are evident. First, all the words are transitional, making it clear that you will need to look at what comes before and after the underlined word to determine the correct answer. Second, you can look for similarities among the answers. “However” and “in contrast” are synonymous, both meaning that what comes before and what comes after are opposites. Since these two options are synonymous, you are able to eliminate them both. While this strategy is likely applicable on just a handful of problems, it can be a powerful tool if you are trying to break the tie between a couple of options.

Do consider widely agreed upon grammar rules. There will be one definite answer. The makers of the SAT ensure that when they ask a

question, it has been thoroughly evaluated so that it clearly has a single answer. The SAT Writing questions will ask you about core grammatical concepts where there is widespread agreement, like subject-verb agreement, proper verb tense, and correct use of punctuation. It is especially important for students who are strong in math to keep this in mind, since they are used to the definitive answers found in math and sometimes feel that grammar rules are a matter of opinion. Keep in mind that while there are many ways that an essay can be crafted, out of the four options given for each SAT Writing question, there will be *one and only one correct answer*.

Don't worry about stylistic preferences and pet peeves. Here are some examples of pet peeves that some people have, which are not considered widely agreed upon grammar rules:

- Using the Oxford comma—a comma before the *and* in a list of three or more items
- Never starting a sentence with *because*
- Never using the more informal second person, *you*, and always using the more formal third person, *he*, *she*, *they*, in papers

The SAT will not test you on concepts like this because not everyone agrees on them. So, you should give the SAT Writing the benefit of the doubt—instead of overthinking a question because you think it is testing some random rule, know that there is indeed one correct answer and look at enough context until you clearly see what that correct answer is.

➤ **Example**

When preparing a college application essay, be sure to tell _____ authentic story. If you have overcome significant challenges in your life or have had interesting experiences, the application essay is a great place to showcase your story.

Which choice completes the text so that it conforms to the conventions of Standard English?

(A) one's

- (B) her
- (C) their
- (D) your

Students are often told to avoid using the second person, “you,” in their writing and instead use the third person, “he, she, or they.” While this is a preference that many educators and writers may have, avoiding the second person is not technically a grammar rule. In this text, we cannot tell from the first sentence what word would be appropriate. It is only after examining the second sentence and seeing that the writer uses “you” and “your” that we realize that in order to be consistent with the wording, choice (D) is correct. This is the only option that uses “you” just like the second sentence does. By realizing that there is one definite answer and that the SAT will not test you on pet peeves, you will be able to keep an open mind as you evaluate the choices.

How Can I Improve My Overall Grammar Knowledge?

- **Read widely.** Reading will, of course, help you improve your reading comprehension. However, it will also greatly help you with grammar. By reading high-quality books and articles, you will develop an intuitive sense of what language sounds proper and what arguments are logically organized. This is especially important when building a sense of what word choices are most appropriate. If you rely too much on a thesaurus when coming up with synonyms, you may have difficulty identifying the word that is best to use in a given context.
- **Write as much as you can.** The more you write, the better you will be at determining what arguments flow well and what organization of your essays is most appropriate. You will have a better sense of how to avoid repetition, maintain parallel structure, and maintain subject-verb agreement. When you have had to be on the lookout for good writing strategies in your own writing, you will be much more in tune with looking for good strategies in the writing of other material.
- **Take rigorous courses that encourage you to write and read high-quality material as much as possible.** While it is tempting to take easier courses where it will not be difficult to earn an (A), this will ultimately be

a disservice to you when it comes to SAT Writing questions. Take courses like AP English Language and Composition, AP English Literature and Composition, and any of the other AP humanities courses. All of these courses will require you to read challenging, high-quality material and to write organized essays. The stronger your reading and writing skills, the better you will do on the SAT Writing.

- **Practice writing in your daily life.** Do not limit your writing to the classroom. Look for opportunities to write recreationally. Instead of texting, try sending an email with full paragraphs. Instead of only video chatting with a distant friend or relative, try writing a letter. Instead of just scanning online articles, give your opinions in the online comments. If you are more ambitious, try entering writing contests, writing a blog of your own, or sending well-crafted correspondence to public officials with your opinions on important issues. Rather than waiting to the last minute to write your college application essays, begin working on them in your junior year so that you can both write the best possible essays and improve your writing and editing skills.
- **Practice editing.** Use a cloud-based word processing program so that you can easily have your papers edited—encourage your friends to do the same. If you and your friends practice editing one another’s papers, not only will your papers be far better, but you will also sharpen the skills needed for success on the SAT Writing.

How Can I Use This Book to Prepare for the SAT Writing?

Practice with the specific types of questions that are most challenging for you:

- **Subject-Verb Agreement** ([pages 223–228](#))
- **Number and Tense Agreement** ([pages 229–231](#))
- **Punctuation** ([pages 232–250](#))
- **Sentence Structure and Organization** ([pages 251–259](#))
- **Transitions** ([pages 260–270](#))
- **Rhetorical Synthesis** ([pages 271–278](#))

Practice with the **Additional Practice Exercises**, starting on page 278, reviewing the types of material you will encounter on the actual test.

Practice with **Advanced Practice**, starting on page 284, that present the most challenging types of Writing questions you could encounter on the SAT.

Practice with the **full-length Reading and Writing tests**, carefully watching your time management.

Good luck!

Grammar Review

Subject-Verb Agreement

The SAT Writing tests your skill in determining whether nouns, pronouns, and verbs agree numerically. A singular subject should be paired with a singular verb, and a plural subject should be paired with a plural verb.

➤ Example 1

Incorrect: My friend's brand new car need to be washed.

Correct: My friend's brand new car needs to be washed.

Explanation: The subject is what is doing the action. In this case, the car is the thing that has to be washed. Since the subject "car" is singular, it requires a singular verb, "needs."

➤ Example 2

Incorrect: The pack of wolves are howling.

Correct: The pack of wolves is howling.

Explanation: The subject is the singular word "pack," not "wolves." Even though there are multiple wolves within a pack, the subject is still just the singular "pack." "Pack" is an example of a *collective noun*—the word refers

to the singular group instead of the plural members of the group. Some other examples of collective nouns include *group*, *flock*, *class*, *herd*, *company*, and *collection*. Watch out for prepositions—words like “to,” “of,” “from,” and “in”—that typically come before a description of the subject. In this example, “of” comes before “wolves,” with “of wolves” describing the subject “pack.” If a word or phrase starts with a preposition, that will likely not be the subject.

➤ Example 3

Incorrect: The smoke detector has dead batteries, which is why they are beeping.

Correct: The smoke detector has dead batteries, which is why **it is** beeping.

Explanation: The earlier nouns in the sentence are “detector” and “batteries.” Which of these could most logically be described as “beeping?” It would have to be a detector—batteries don’t beep. So, both the pronoun and the verb must change to be the singular “it is” instead of the plural “they are.”

➤ Example 4

Incorrect: When Darnell and Liam go to the game, he always insists on paying for the tickets.

Correct: When Darnell and Liam go to the game, **Darnell** always insists on paying for the tickets.

Explanation: If a pronoun is vague, it must be clarified. In this case, the “he” could have referred to either Darnell or Liam. By revising it to have the person’s actual name, the sentence becomes clear. Sometimes students worry about replacing a pronoun, thinking that they cannot be certain as to its substitute. Do not worry about that—if a pronoun needs to be replaced because it is vague, consider the potential replacements to be true.

► Example 5

Incorrect: Everybody in the school are excited for the assembly.

Correct: Everybody in the school is excited for the assembly.

Explanation: “Everybody” is singular, even though it refers to several people. Other singular pronouns include *everyone*, *anybody*, *no one*, *someone*, *another*, *either*, *neither*, and *each*. If you are unsure if a pronoun is singular or plural, simply take the pronoun and place it next to the verb to see if it makes sense. For example, you would say “anybody is here” instead of “anybody are here.”

Singular and Plural Agreement Practice—select the correct choice given the context.

1. The food for both of my dogs (A) is or (B) are expensive.
2. My friend Andrew forgot (A) its or (B) his lunch money.
3. (A) These or (B) This books are really interesting.
4. All the cars, including mine, (A) is or (B) are legally parked on the street and will not be towed.
5. The flock of geese (A) are or (B) is migrating south for the winter.
6. My English teacher and my math teacher always (A) give or (B) gives detailed instructions in class.
7. The lamp, which has three light bulbs, (A) is or (B) are in need of some maintenance.
8. I discovered in my studies that while I enjoyed painting and sculpture, (A) it was or (B) they were music I found most appealing.
9. The sights and sounds of the World’s Fair (A) were or (B) was truly memorable.
10. A dog that can still walk on all fours (A) are or (B) is considered mobile.
11. When starting the car, be sure that (A) the emergency brake or (B) it is deactivated.
12. (A) Those or (B) This plants really have to be watered.
13. The captain of the team (A) has led or (B) have led her team to victory.

14. When one is speaking to one's friends online, one should be certain that the chat is from one's friends (A) themselves or (B) oneself and not from a bot.
15. The car and truck were in a close race, with (A) the one or (B) the truck currently in the lead.
16. Anyone who loves the great outdoors (A) is or (B) are excited for good weather.
17. Neither terrible snow nor awful rain (A) keeps or (B) keep the mail from being delivered.
18. Halley's Comet, one of the solar system's short period comets, (A) is or (B) are projected to pass by Earth in the year 2061.
19. Since (A) it or (B) they will not be available on the trail, bring food and water with you for the backpacking journey.
20. Zaha Hadid, an architect known for her parametric designs (i.e., ones that embrace adaptive shapes and forms), (A) are or (B) is a native of Iraq.

✓ Answers

1. The food for both of my dogs (A) is expensive. "Food" is the subject and is singular.
2. My friend Andrew forgot (B) his lunch money. "Andrew" is a singular person, so "his" would be appropriate.
3. (A) These books are really interesting. "Books" is a plural word and "these" is used in reference to plural nouns.
4. All the cars, including mine, (B) are legally parked on the street and will not be towed. In this case, "all" is referring to the entire set of cars and is plural.
5. 5. The flock of geese (B) is migrating south for the winter. "Flock" is a collective noun and is singular.
6. My English teacher and my math teacher always (A) give detailed instructions in class. There is a compound subject with both the

English teacher and the math teacher, so the plural verb “give” is needed.

7. The lamp, which has three light bulbs, (A) is in need of some maintenance. The subject is “lamp,” not “light bulbs,” and “lamp” is a singular word that needs the singular verb “is.”
8. I discovered in my studies that while I enjoyed painting and sculpture, (A) it was music I found most appealing. The singular subject “music” comes later in the sentence, but it is in fact the thing that the narrator finds most appealing.
9. The sights and sounds of the World’s Fair (A) were truly memorable. There is a compound subject—sights and sounds—that requires a plural verb, “were.”
10. A dog that can still walk on all fours (B) is considered mobile. The subject is the singular “dog,” not the plural “fours.” Thus, the singular verb “is” would be correct.
11. When starting the car, be sure that (A) the emergency brake is deactivated. In this case, there is a vague pronoun, so clarifying it by saying “the emergency brake” would be appropriate.
12. (A) Those plants really have to be watered. The word “plants” is plural, so the word “those” would be correct.
13. The captain of the team (A) has led her team to victory. The subject is “captain,” which is singular. A singular verb “has” is needed.
14. When one is speaking to one’s friends online, one should be certain that the chat is from one’s friends (A) themselves and not from a bot. The word “themselves” refers to the word “friends,” which is plural.
15. The car and truck were in a close race, with (B) the truck currently in the lead. The pronoun would be vague in this case, so clarify with “the truck.”
16. Anyone who loves the great outdoors (A) is excited for good weather. The word “anyone” is considered to be singular, so the singular “is”

would match.

17. Neither terrible snow nor awful rain (A) keeps the mail from being delivered. “Neither” and “nor” refer to objects one at a time instead of collectively, and require a singular verb; “keeps” is singular and would work.
18. Halley’s Comet, one of the solar system’s short period comets, (A) is projected to pass by Earth in the year 2061. The verb must agree with the singular “comet,” not the plural “comets,” since it is the “comet” that will be coming by Earth in the future.
19. Since (B) they will not be available on the trail, bring food and water with you for the backpacking journey. The plural word “they” refers to the plural “food and water” that should go on the trail with a hiker.
20. Zaha Hadid, an architect known for her parametric designs (i.e., ones that embrace adaptive shapes and forms), (B) is a native of Iraq. Go back to the beginning of the sentence to see that the subject is the singular person Zaha Hadid, and not the other possible nouns like “designs,” “shapes,” or “forms.”

Verb Agreement

The SAT Writing will test your skill in verb usage. You will often be asked to determine whether a verb is used in the correct tense. Be aware of the basics of verb conjugation, as outlined in this table (you may have learned quite a bit of verb conjugation in a world language course).

Present	Past	Future
She is They are I am	She was They were I was	She will They will I will
Present Perfect	Past Perfect	Future Perfect
She has been They have been I have been	She had been They had been I had been	She will have been They will have been I will have been

► Example 1

Incorrect: I went on a trip to Florida, and I have a memorable experience.

Correct: I went on a trip to Florida, and I **had** a memorable experience.

Explanation: Make sure that the verbs are used consistently in the sentence. Change “have” to “had” so that the sentence is all in the past tense.

► Example 2

Incorrect: My friend’s group has been working hard on the school project, while most of the other groups are not doing so.

Correct: My friend’s group has been working hard on the school project, while most of the other groups **have not been** doing so.

Explanation: The project has not yet been completed—it is an ongoing activity, so the present perfect tense is appropriate.

► Example 3

In addition to ensuring that verbs are in the correct tense, the SAT Writing will ask questions to check for both tense *and* number agreement.

Incorrect: When Eli lived across from two excellent parks, he have ample opportunities for outdoor recreation.

Correct: When Eli lived across from two excellent parks, he **had** ample opportunities for outdoor recreation.

Explanation: In the first version, “have” is incorrect with subject-verb agreement and tense. In the corrected version, “had” uses the correct past tense and is numerically consistent with the subject “Eli.”

Verb Agreement Practice—select the correct choice given the context.

1. Yesterday, I (A) ate or (B) eat lunch at home.
2. Whenever I walk past that store, I always (A) felt or (B) feel like making a purchase.
3. My two aunts have always (A) taken or (B) took the bus to work.
4. The large boulder fell into the river and (A) diverted or (B) divert the water out of its typical path.
5. You should leave a nice review for a travel guide who (A) do or (B) does a good job.
6. Before watching the sequel, I (A) watching or (B) watched the prequel.
7. They have been swimming since early this morning and (A) is or (B) are continuing to do so now.
8. If you have the instructions, assembly of the new bicycle (A) were or (B) is easy.
9. It would (A) have or (B) had been an easy test if I had studied some more.
10. My neighbor will not (A) entertained or (B) entertain any new offers to purchase his old car.
11. When she flew to visit her relatives overseas, she (A) took or (B) takes only two flights.
12. The Renaissance artist (A) draws or (B) drew pencil sketches before he turned his ideas into paintings.
13. I will read my textbook this evening after I (A) had completed or (B) complete my other homework.
14. An infant may have trouble falling asleep, while teenagers rarely (A) has or (B) have any difficulty doing so.
15. The guard dog barked at a predator that (A) approached or (B) will approach the herd of sheep.
16. My father is unsure of what dish to (A) brought or (B) bring to the potluck dinner.
17. The flock of birds (A) have or (B) has taken off from the steep cliff to find food.
18. Emma did a great job on her last assignment, and I am confident she (A) will do or (B) had done well on the one due next week.
19. Jesse Owens, winner of four Olympic gold medals, (A) was or (B) were born in Oakville, Alabama.

20. What colleges have you (A) chose or (B) chosen for your in-person visits?

✓ Answers

1. Yesterday, I (A) ate lunch at home.
“Ate” is in the past tense, which makes sense given that the sentence begins with “yesterday,” putting the event in the past.
2. Whenever I walk past that store, I always (B) feel like making a purchase.
“Feel” is in the present tense, consistent with the earlier present tense verb “walk.”
3. My two aunts have always (A) taken the bus to work.
“Have taken” is the correct conjugation, while “have took” would not work; “took” by itself is fine to express the past tense, but not in conjunction with “have.”
4. The large boulder fell into the river and (A) diverted the water out of its typical path.
The earlier verb “fell” is in the past tense, so use “diverted” to be consistent throughout the sentence.
5. You should leave a nice review for a travel guide who (B) does a good job.
The noun “guide” is singular and therefore requires a singular verb, “does.”
6. Before watching the sequel, I (B) watched the prequel.
Using “watched” is logical given that this is a past series of events; also, using “watching” would prevent this from being a complete sentence.
7. They have been swimming since early this morning and (B) are continuing to do so now.
“Are” is consistent with the earlier subject “they.”

8. If you have the instructions, assembly of the new bicycle (B) is easy.
“Is” will keep the sentence in the present tense, and it will be consistent with the singular subject “assembly.”
9. It would (A) have been an easy test if I had studied some more.
Use “have” in conjunction with “would have.” It can be fine to say “if it had,” but do not use the word “would” along with “had.”
10. My neighbor will not (B) entertain any new offers to purchase his old car.
“Will not entertain” is the proper conjugation to express that this will take place in the future; “entertained” is fine as a past tense option, but not along with “will not.”
11. When she flew to visit her relatives overseas, she (A) took only two flights.
“Took” is consistent with the earlier past tense verb “flew.”
12. The Renaissance artist (B) drew pencil sketches before he turned his ideas into paintings.
Look later in the sentence to see that it is in the past tense given the verb “turned”; therefore, use the past tense “drew” for consistency.
13. I will read my textbook this evening after I (B) complete my other homework.
Since the textbook reading is happening in the future after the completion of the homework, it is appropriate to use the present tense for “complete.”
14. An infant may have trouble falling asleep, while teenagers rarely (B) have any difficulty doing so.
“Have” will be consistent with the plural subject “teenagers.”
15. The guard dog barked at a predator that (A) approached the herd of sheep.
“Approached” is consistent with the past tense verb “barked” earlier in the sentence.

16. My father is unsure of what dish to (B) bring to the potluck dinner.
“To bring” is the correct infinitive form of the verb, not “to brought.”
17. The flock of birds (B) has taken off from the steep cliff to find food.
The subject is the singular noun “flock,” so “has” would be consistent with it.
18. Emma did a great job on her last assignment, and I am confident she (A) will do well on the one due next week.
Based on context clues, the correct verb will be “will do” since the next assignment is one that has not yet been evaluated.
19. Jesse Owens, winner of four Olympic gold medals, (A) was born in Oakville, Alabama.
The subject is the singular person “Jesse Owens,” not the plural “medals”; therefore, use the singular verb “was.”
20. What colleges have you (B) chosen for your in-person visits?
“Have chosen” is the correct conjugation of the verb, not “have chose.”

Number and Tense Agreement Practice Questions

1. Anyone who assembles comic book collections probably _____ superheroes. After all, Batman, Superman, Wonder Woman, and Spiderman are some of the most popular characters found in these books.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) enjoy
- (B) enjoying
- (C) enjoys
- (D) to enjoy

2. The two hockey teams were evenly matched—throughout the game, the team that was ahead changed many times. After a hard-fought contest, the _____. Ultimately their goalie's defensive prowess proved pivotal.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) blue team won the game.
 - (B) game was won by the blue team.
 - (C) winning by the blue team was completed.
 - (D) blue team winning of the game was done.
3. A variety of diplomats gathered at the conference to discuss the new treaty. Out of the officials present, the Secretary General of the United Nations _____ the most well-respected.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) will
 - (B) were
 - (C) are
 - (D) was
4. Three years ago, she went on vacation and _____ her relatives. Now she is going to do a similar trip with her family but plans to go to a different destination.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) will visit
- (B) visited
- (C) visiting
- (D) visit

5. The three friends were excited to meet up for a stroll in the new city park. Jennifer and Debby couldn't wait to see _____ new dog.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) her
- (B) their
- (C) Pam's
- (D) whose

6. Now that we have started the new employee training, I must make my expectations about tardiness very clear. I require that everyone _____ punctual. If you cannot show up on time for the job, you might as well not show up at all.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) is
- (B) be
- (C) are
- (D) was

7. When you are looking for a new job, there are a few things to keep in mind. You should work on your networking skills, _____ resume, and your references.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) your
- (B) one's
- (C) you're
- (D) its

8. My friend and I went on a hike around the lake. We saw fish, plants, and plenty of birds. In fact, there was a flock of geese that _____ at least 30 birds.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) has
- (B) have
- (C) had
- (D) having

9. Make sure you are ready the day before the SAT with everything that you will need. Because _____ not provided at the testing center, a bottle of water and a snack are two things you should take with you.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) they are
- (B) it is
- (C) you are
- (D) we are

10. We look out the window of our apartment and can see many things happening. There are people walking on the sidewalk and kids playing on the playground. Also, _____

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) the cars driving down the freeway.
- (B) the cars are driving down the freeway.
- (C) the cars are drive down the freeway.
- (D) the cars down the freeway driving.

Answer Explanations

1. **(C)** The subject is “anyone,” which is singular—it refers to each person one at a time. “Enjoys” is the only verb that would work to provide a complete sentence that aligns with a singular subject.
2. **(A)** This option puts the words in the most logical order, making it clear that the blue team won the game. Choices (B) and (C) use the passive voice with “by.” Choice (D) has a convoluted word order.
3. **(D)** This verb aligns with the singular person of the “Secretary General,” so the singular verb “was” works. Also, it is in the past tense, consistent with the earlier past tense verb “gathered.” The other options are either in the incorrect tense, like “will,” or plural, like “were” and “are.”
4. **(B)** The verb “went” earlier in the sentence is in the past tense, and “visited” is the only option that is also in the past tense.
5. **(C)** Pronouns are perfectly fine to use so long as what they represent is clear. In this sentence, it is unclear who possesses the dog unless the owner is specifically named as in choice (C). The other options would leave the ownership unclear.
6. **(B)** Since this is a demand, the verb “be” is appropriate. The other options would not be typically used in a command.
7. **(A)** This is the only option that maintains parallelism with the other parts of the list—they all begin with “your.”
8. **(C)** “Had” is consistent with the past tense verb “was” earlier in the sentence. The other options are not in the past tense.
9. **(A)** To see what pronoun is needed, look at what comes later in the sentence. A watch and a snack are the things that are not provided, so in reference to these two things, “they” is the only possibility.

10. **(B)** This option puts the words in a logical sequence and provides a complete sentence by saying “cars are driving.” Choices (A) and (D) result in a sentence fragment. Choice (C) should use “driven” instead of “drive” in conjunction with “are.”

Punctuation

Commas

When it comes to comma questions on the SAT, it is important to know both *when* to use a comma and *when NOT* to use a comma. You may be able to intuitively tell when to use a comma by mouthing out the sentence in your head and “hearing” where a small breath or pause would be. However, it is helpful to know specific rules about when and when not to use commas so that you can do your best.

Do use a comma to separate an introductory phrase (dependent clause) from a complete sentence (independent clause).

Correct: Whenever my brother sleeps, he snores loudly.

Correct: If you are happy with your grade, put the paper on your refrigerator.

Explanation: In both of these examples, there is an introductory phrase followed by a complete sentence. A comma is great for separating dependent clauses (incomplete thoughts that cannot stand on their own) from complete sentences (a complete idea with both a subject and a verb).

Don't use a comma by itself to join two complete sentences (independent clauses).

Incorrect: Jean went for a walk around town, she saw many different neighborhoods.

Correct: Jean went for a walk around town, **and** she saw many different neighborhoods.

Incorrect: My friend loves to paint, he makes large messes when doing so.

Correct: My friend loves to paint, **but** he makes large messes when doing so.

Explanation: A comma by itself cannot separate one complete sentence from another—this error is called a *comma splice*. If you had a word like *and*, *but*, or *yet* along with the comma, that would be fine. Also, a semicolon, period, and sometimes a dash or colon can work to separate complete sentences.

Do use a comma before and after a parenthetical phrase (i.e., words that are added to a sentence without changing the original sentence’s grammar or meaning).

Correct: The first person to walk on the moon, Neil Armstrong, is a native of the state of Ohio.

Correct: Jigsaw puzzles, unlike crossword puzzles, involve visual pattern recognition.

Correct: A box of my favorite cereal, which I purchased on sale, is what my family will have for breakfast this week.

Explanation: The phrases “Neil Armstrong,” “unlike crossword puzzles,” and “which I purchased on sale” could be removed from the original sentences and the sentences would remain complete with their original meanings. Note that parenthetical phrases will often start with *which*. (If *which* is used without a parenthetical phrase, like “the building in which I will take the SAT,” no comma before *which* is needed).

Don’t use a comma to separate the subject from the verb in a sentence.

Incorrect: My best friend, is moving out of town.

Correct: My best friend is moving out of town.

Incorrect: Football players and basketball players, both use locker rooms to get ready.

Correct: Football players and basketball players both use locker rooms to get ready.

Incorrect: The book, that I have almost finished is very suspenseful.

Correct: The book that I have almost finished is very suspenseful.

Explanation: These sentences would work if the commas were removed. Just because a sentence has a long subject does not mean that it requires a comma. Note that phrases that do not require a comma will often start with *that*. *That* indicates that a phrase is restrictive, or essential, to the sentence's meaning.

Do use a comma to separate words within a list.

Correct: I will pick up apples, bananas, and oranges at the fruit stand.

Don't use a comma right *before* a list begins.

Incorrect: At the fruit stand, I will pick up, oranges, apples, and bananas.

Correct: At the fruit stand, I will pick up oranges, apples, and bananas.

Explanation: There is no need for a comma after “pick up” in the second sentence. Just use commas to separate the items within the list.

Note: The SAT uses the Oxford comma with lists: the comma before the *and* that comes before the final item. However, since the Oxford comma is more of a stylistic choice than a grammar rule, they most likely will not test you on this concept.

Do use a comma along with coordinating conjunctions to connect two complete sentences. Coordinating conjunctions provide a strong connection between sentences. Remember coordinating conjunctions with the acronym FANBOYS (For, And, Nor, But, Or, Yet, So).

Correct: My sister was hungry, so she grabbed a snack from the kitchen.

Correct: I studied quite a bit for the test, but I did not perform as well as I would have liked.

Don't just use a comma to connect two complete sentences joined by a conjunctive adverb (e.g., however, indeed, nevertheless, moreover, namely, meanwhile, subsequently, thus, furthermore). Conjunctive adverbs provide a weaker connection between sentences. Instead, use a semicolon with a comma.

Incorrect: He was delighted to be promoted, however, he was not happy with the new work schedule.

Correct: He was delighted to be promoted; however, he was not happy with the new work schedule.

Incorrect: The tour started at the museum, subsequently, it went to the park.

Correct: The tour started at the museum; subsequently, it went to the park.

Note: It is fine to use conjunctive adverbs with just commas so long as they are not used to connect two complete sentences:

Correct: My friend wanted me to come to his house. Instead, I decided to stay home.

Correct: Most birds can fly. The penguin, however, cannot.

Explanation: While a comma by itself is not enough to join two complete sentences, a comma along with one of the FANBOYS words *will* be enough. Be sure that the word joining the two complete sentences is one of these FANBOYS words—if it is one of the conjunctive adverbs, use a semicolon before the conjunctive adverb and a comma after the conjunctive adverb to make the connection.

Do use commas to separate adjectives if the order of the adjectives *does not* matter.

Correct: The fluffy, friendly puppy likes to wag its tail.

Correct: The friendly, fluffy puppy likes to wag its tail.

Explanation: It does not change the meaning of the sentence whether “fluffy” or “friendly” comes first.

Don’t use commas to separate adjectives if the order of the adjectives *does* matter.

Incorrect: The first, female governor won a large majority of the vote.

Incorrect: The female, first governor won a large majority of the vote.

Correct: The first female governor won a large majority of the vote.

Explanation: The order of the adjectives “first” and “female” does matter —“first” must come before “female” in order for the sentence to be logical. In this situation, do not use commas to separate the adjectives.

Comma Practice—select the better sentence out of the two options.

1. (A) Once upon a time, the kingdom was under attack.
(B) Once upon a time the kingdom was under attack.
2. (A) My Advanced Placement World History class, is very interesting.
(B) My Advanced Placement World History class is very interesting.
3. (A) I needed a quiet place to read, so I went to the library.
(B) I needed a quiet place to read so I went to the library.
4. (A) The pedestal onto, which you place the trophies should be sturdy.
(B) The pedestal onto which you place the trophies should be sturdy.

5. (A) If you are going to do well on your test, be sure to get a good night's sleep.
(B) If you are going to do well on your test be sure to get a good night's sleep.
6. (A) One example of a large animal, is the blue whale.
(B) One example of a large animal is the blue whale.
7. (A) The first person to walk across Antarctica without any assistance Colin O'Brady took 54 days to do so.
(B) The first person to walk across Antarctica without any assistance, Colin O'Brady, took 54 days to do so.
8. (A) Essential ingredients for the cake are flour, sugar, and eggs.
(B) Essential ingredients for the cake are flour sugar and eggs.
9. (A) The results of the study, indicate that the medicine is highly effective.
(B) The results of the study indicate that the medicine is highly effective.
10. (A) The saw is extremely precise, cutting each edge flawlessly.
(B) The saw is extremely precise cutting each edge flawlessly.
11. (A) Broccoli, though not my friend's favorite, is something I love to eat whenever I can.
(B) Broccoli though not my friend's favorite is something I love to eat whenever I can.
12. (A) The chair that is by the window is extremely comfortable.
(B) The chair, that is by the window, is extremely comfortable.
13. (A) Each morning, I like to take a shower, eat breakfast, and gather my things for school.
(B) Each morning, I like to take a shower eat breakfast, and gather my things for school.

14. (A) Inflation is largely attributable to the ever-increasing prices of different goods and services.
(B) Inflation is largely attributable, to the ever-increasing prices of different goods and services.
15. (A) The ping-pong table in the middle of the gymnasium, is where I spend my time after eating lunch.
(B) The ping-pong table in the middle of the gymnasium is where I spend my time after eating lunch.
16. (A) Our house, which we moved into last year, is still in good condition.
(B) Our house which we moved into last year is still in good condition.
17. (A) The job of a lifeguard, is to vigilantly keep watch over the beach.
(B) The job of a lifeguard is to vigilantly keep watch over the beach.
18. (A) You did an excellent job on your group project; moreover, you aced your final exam.
(B) You did an excellent job on your group project, moreover, you aced your final exam.
19. (A) My newest neighbor Jian, loves to play basketball in his driveway.
(B) My newest neighbor, Jian, loves to play basketball in his driveway.
20. (A) If you are passionate about your profession, work will not feel like “work.”
(B) If you are passionate about your profession work will not feel like “work.”
21. (A) The new volleyball coach, was excited for the team’s first game.
(B) The new volleyball coach was excited for the team’s first game.
22. (A) Cold-brewed coffee, though not my personal favorite, has become increasingly popular.
(B) Cold-brewed coffee, though not my personal favorite has become increasingly popular.

23. (A) The traffic, that clogged up the highway for eight straight miles, was quite a nuisance.
(B) The traffic that clogged up the highway for eight straight miles was quite a nuisance.
24. (A) My videoconferencing software which I just updated helped me to meet with faraway relatives.
(B) My videoconferencing software, which I just updated, helped me to meet with faraway relatives.
25. (A) Several thousand years ago, people, along with many animals, traversed an ice bridge from Eurasia to the Americas.
(B) Several thousand years ago people, along with many animals traversed an ice bridge from Eurasia to the Americas.

✓ **Answers**

1. (A) Once upon a time, the kingdom was under attack.
Place a comma after the introductory phrase.
2. (B) My Advanced Placement World History class is very interesting.
Don't separate the subject from the verb with a comma.
3. (A) I needed a quiet place to read, so I went to the library.
"So" is one of the FANBOYS words, and can therefore be used to join two sentences along with a comma.
4. (B) The pedestal onto which you place the trophies should be sturdy.
This is an example of using "which" when it does not precede a parenthetical phrase—thus, no comma is needed.
5. (A) If you are going to do well on your test, be sure to get a good night's sleep.
Use a comma to separate the introductory phrase from the complete sentence that follows.
6. (B) One example of a large animal is the blue whale.

There is no need to separate the subject and the verb.

7. **(B)** The first person to walk across Antarctica without any assistance, Colin O’Brady, took 54 days to do so.
Surround the name with commas since the sentence will maintain its meaning and grammar without it.
8. **(A)** Essential ingredients for the cake are flour, sugar, and eggs.
Use commas to separate the items in the list.
9. **(B)** The results of the study indicate that the medicine is highly effective.
There is no need to separate the subject and the verb with a comma.
10. **(A)** The saw is extremely precise, cutting each edge flawlessly.
Use a comma to separate the complete sentence from the dependent clause that follows.
11. **(A)** Broccoli, though not my friend’s favorite, is something I love to eat whenever I can.
Surround the parenthetical phrase with commas.
12. **(A)** The chair that is by the window is extremely comfortable.
There is no need for commas when using “that” to describe something essential to the subject.
13. **(A)** Each morning, I like to take a shower, eat breakfast, and gather my things for school. Use commas to separate the items in the list.
14. **(A)** Inflation is largely attributable to the ever-increasing prices of different goods and services.
Do not use a comma to break up the phrase “attributable to.”
15. **(B)** The ping-pong table in the middle of the gymnasium is where I spend my time after eating lunch.
Even though there is a long subject in the sentence, do not use a comma to separate the subject from the verb.

16. **(A)** Our house, which we moved into last year, is still in good condition.
Use commas around the parenthetical phrase that begins with “which.”
17. **(B)** The job of a lifeguard is to vigilantly keep watch over the beach.
Do not separate the subject from the verb.
18. **(A)** You did an excellent job on your group project; moreover, you aced your final exam. Use a semicolon, not a comma, to separate two sentences joined by a conjunctive adverb.
19. **(B)** My newest neighbor, Jian, loves to play basketball in his driveway.
“Jian” is the same person as “my newest neighbor,” so his name can be set off with commas.
20. **(A)** If you are passionate about your profession, work will not feel like “work.”
Use commas to separate the introductory phrase from the complete sentence that follows.
21. **(B)** The new volleyball coach was excited for the team’s first game.
Do not separate the subject from the verb.
22. **(A)** Cold-brewed coffee, though not my personal favorite, has become increasingly popular. Surround the parenthetical phrase with commas.
23. **(B)** The traffic that clogged up the highway for eight straight miles was quite a nuisance.
No commas are needed to surround an essential phrase starting with “that.”
24. **(B)** My videoconferencing software, which I just updated, helped me to meet with faraway relatives.
Surround the parenthetical, nonessential phrase that begins with “which” with commas.

25. (A) Several thousand years ago, people, along with many animals, traversed an ice bridge from Eurasia to the Americas.
Use a comma after “people” to separate the introductory phrase, and also use commas around the parenthetical phrase “along with many animals.”

Semicolons

Use a semicolon (;) to separate two complete, related sentences from one another. While a period could be substituted for a semicolon in most cases, using the semicolon allows for more stylistic variety in one’s writing.

Correct: I am excited to go to the concert; I will show up early to be first in line.

Incorrect: While I am excited to go to the concert; there is no way I want to show up early to wait.

Correct: While I am excited to go to the concert, there is no way I want to show up early to wait.

Explanation: If there are complete sentences on either side of the semicolon, it is appropriate to use one. If there is a sentence fragment on either side of the semicolon, change the sentence structure (perhaps by substituting a comma for the semicolon) to make it work.

Use a semicolon to separate items in a list when each item has internal punctuation, like a comma, within it.

Correct: When I tour colleges, I am looking forward to checking out Boston, Massachusetts; Ithaca, New York; and Providence, Rhode Island.

Incorrect: When I tour colleges, I am looking forward to checking out Boston, Massachusetts, Ithaca, New York, and Providence, Rhode Island.

Explanation: The semicolons create a clear distinction between each place that is denoted as a city and state. Without the semicolons to separate these

items, it would seem like the cities and states were different things.

Semicolon Practice—select the better sentence out of the two options.

1. (A) This is the best book I have ever read, I simply cannot put it down.
(B) This is the best book I have ever read; I simply cannot put it down.
2. (A) A positive attitude can help you overcome adversity, no matter the circumstances.
(B) A positive attitude can help you overcome adversity; no matter the circumstances.
3. (A) It was supposed to be a cloudy day, however, the weather forecast was fortunately incorrect.
(B) It was supposed to be a cloudy day; however, the weather forecast was fortunately incorrect.
4. (A) The most critical people on the movie set are John, the director; Susan, the producer; and Harris, the lead actor.
(B) The most critical people on the movie set are John, the director, Susan, the producer, and Harris, the lead actor.
5. (A) If the grass is dry, water the lawn.
(B) If the grass is dry; water the lawn.

Answers

1. **(B)** This is the best book I have ever read; I simply cannot put it down.
Use a semicolon to separate the two complete sentences.
2. **(A)** A positive attitude can help you overcome adversity, no matter the circumstances.
“No matter the circumstances” is not a complete sentence, so separate it from the complete sentence that comes before it with a comma.
3. **(B)** It was supposed to be a cloudy day; however, the weather forecast was fortunately incorrect.

Recall that with conjunctive adverbs (like “however”) that join two complete sentences, use a semicolon followed by a comma.

4. (A) The most critical people on the movie set are John, the director; Susan, the producer; and Harris, the lead actor.
Use semicolons to separate the items in the list that have internal punctuation.
5. (A) If the grass is dry, water the lawn.
A comma will work to separate the introductory phrase from the complete sentence.

Colons

Use a colon (:) if it comes after a complete sentence and introduces a clarification or a list. If an idea is not fully expressed, the colon can set off the information that will complete the thought.

Correct: After many years of hard work, I have achieved my lifelong dream: hiking up a tall mountain.

Correct: French mirepoix uses these ingredients: carrots, onions, and celery.

Colon Practice—select the better sentence out of the two options.

1. (A) My houseplant requires the following to thrive sunlight, fertilizer, and water.
(B) My houseplant requires the following to thrive: sunlight, fertilizer, and water.
2. (A) The office workers finally agreed on the setting for the thermostat: 72 degrees.
(B) The office workers finally: agreed on the setting for the thermostat 72 degrees.
3. (A) You should take: your suitcase, backpack, and wallet with you on the trip.

- (B) You should take your suitcase, backpack, and wallet with you on the trip.
4. (A) We were delighted to see two of our favorite animals at the zoo: elephants and tigers.
(B) We were delighted to see two of our favorite animals at the zoo elephants and tigers.
5. (A) No matter how you choose to season your food, salt and pepper are recommended items to have on a dinner table.
(B) No matter how you choose to season your food: salt and pepper are recommended items to have on a dinner table.

Answers

1. **(B)** My houseplant requires the following to thrive: sunlight, fertilizer, and water.
The colon comes before the list of items the plant requires to thrive.
2. **(A)** The office workers finally agreed on the setting for the thermostat: 72 degrees.
This is the correct placement for the colon since it comes after a complete sentence and before a clarification.
3. **(B)** You should take your suitcase, backpack, and wallet with you on the trip.
Not every list will require a colon to come before it. In this case, a colon would cause a very abrupt pause.
4. **(A)** We were delighted to see two of our favorite animals at the zoo: elephants and tigers. The colon comes before the clarification of which animals were at the zoo.
5. **(A)** No matter how you choose to season your food, salt and pepper are recommended items to have on a dinner table.
Since “No matter how you choose to season your food” is not a complete sentence, having a colon after it would not work. Use a

comma instead.

Dashes

Use a dash (—) to indicate a change of thought or change of voice in a sentence.

Correct: I would not go down that alley—it looks very spooky.

Correct: Wait—I am not ready to go.

Use dashes to surround a parenthetical phrase. Start and finish the parenthetical phrase using the same punctuation, like commas, dashes, or parentheses.

Correct: Las Vegas—a major tourist town—is surprisingly surrounded by desert.

Incorrect: Las Vegas—a major tourist town, is surprisingly surrounded by desert.

Note: With the above examples, other forms of punctuation could have been used instead of the dash. You have a great deal of flexibility in your punctuation choices in more complex sentences. *However, do not worry about whether the SAT will have two correct options.* If a colon could be used for a dash and vice versa, only one of these options will be presented.

Dash Practice—select the better sentence out of the two options.

1. (A) My favorite food—pizza—is easily found at many restaurants.
(B) My favorite food, pizza—is easily found at many restaurants.
2. (A) The backpacking journey looks quite challenging—be prepared.
(B) The backpacking journey looks quite challenging be prepared.
3. (A) My science teacher—a former government researcher—is excellent at helping us see the applications of what we learn.

- (B) My science teacher—a former government researcher is excellent at helping us see the applications of what we learn.
4. (A) Based on the latest data, the geologists could only come to one conclusion—a volcanic eruption was imminent.
(B) Based on the latest data, the geologists could only come to one conclusion a volcanic eruption was imminent.
5. (A) My friends Sharon and Maria are coming over to my house this evening.
(B) My friends Sharon—and Maria—are coming over to my house this evening.

Answers

1. (A) My favorite food—pizza—is easily found at many restaurants.
Be consistent in using the same type of punctuation on either side of parenthetical phrases.
2. (A) The backpacking journey looks quite challenging—be prepared.
Have a dash toward the end of the sentence to indicate the change of thought.
3. (A) My science teacher—a former government researcher—is excellent at helping us see the applications of what we learn.
Surround the clarification about the science teacher’s background with dashes.
4. (A) Based on the latest data, the geologists could only come to one conclusion—a volcanic eruption was imminent.
Have a dash before the clarification of what the conclusion was.
5. (A) My friends Sharon and Maria are coming over to my house this evening.
There is no need for dashes in this situation because there is no parenthetical phrase. Instead, “Maria” is part of the subject.

Apostrophes

Common Situations

Use an apostrophe (') *before* an *s* to show singular possession.

- One pet's dish
- A person's house
- Caitlin's shoes
- My car's steering wheel

Use an apostrophe *after* an *s* to show plural possession.

- Three pets' fence
- Seven cars' parking lot spaces
- Our books' shelf
- Three families' neighborhood

Note: It does not matter how many things are possessed/owned; it matters *how many owners* there are.

Less Common Situations

Use an apostrophe *before* an *s* to show possession if the word is already plural.

- The women's organization
- The children's playground

Use just one apostrophe if both of the nouns in a compound subject *jointly* own something.

- Pam and Andy's family (they share a family)
- The cat and dog's toys (they share the toys)

Use apostrophes after each of the nouns in a sequence if each noun *individually* possesses an item.

- Aliyah's and Olivia's report cards were each excellent. (Aliyah and Olivia have their own report cards.)

- My sister’s and my brother’s rooms are both messy. (The sister and brother individually have messy rooms.)

Note: Do not worry about apostrophe placement exceptions for names ending in s. The SAT will stick to widely agreed upon apostrophe rules.

TIP

Another way to keep these rules straight is to realize that if you remove the apostrophe and what comes after it, you will get the original non-possessive word.

For example:

Possessive Form	What to Remove	Original Word
Dog’s	’s	Dog
Friends’	’	Friends
Men’s	’s	Men

Apostrophes and Pronouns

Do use an apostrophe on pronoun contractions—ones that have a pronoun and verb together.

- It’s a beautiful day outside. (same as “it is”)
- They’re coming over this evening. (same as “they are”)
- You’re doing well with your homework. (same as “you are”)

Don’t use an apostrophe with pronouns that show possession.

- The bicycle needs its tires inflated. (The tires belong to the bicycle.)
- Their clothes are now clean. (The clothes belong to the implicit people.)
- You should mind your manners at dinner. (The manners belong to you.)

Apostrophe Practice—select the better sentence out of the two options.

1. (A) One persons’ trash is another person’s treasure.
(B) One person’s trash is another person’s treasure.
2. (A) The teachers’ are meeting to share their best lesson ideas.

- (B) The teachers are meeting to share their best lesson ideas.
3. (A) The natural history museum's planetarium is extremely impressive.
(B) The natural history museums planetarium is extremely impressive.
4. (A) Whenever my relatives come over, we need to order extra food.
(B) Whenever my relatives' come over, we need to order extra food.
5. (A) Humpback whales love to swim in the open ocean.
(B) Humpback whales' love to swim in the open ocean.
6. (A) The Broadway show's sets are difficult to move.
(B) The Broadway show's set's are difficult to move.
7. (A) When the new coach helped the men's soccer team, he made significant adjustments to the lineup.
(B) When the new coach helped the mens' soccer team, he made significant adjustments to the lineup.
8. (A) As you read the joint paper by the scientists, note how Watson's and Crick's results match their hypothesis.
(B) As you read the joint paper by the scientists, note how Watson and Crick's results match their hypothesis.
9. (A) His backpack needs it's straps repaired.
(B) His backpack needs its straps repaired.
10. (A) The three farmers' fields encompassed over 500 acres.
(B) The three farmers fields encompassed over 500 acres.

✓ **Answers**

1. **(B)** One person's trash is another person's treasure.
Since it is just one person who possesses the trash, have the apostrophe before the s.
2. **(B)** The teachers are meeting to share their best lesson ideas.

No apostrophe is needed since the teachers are not showing possession.

3. **(A)** The natural history museum's planetarium is extremely impressive.
The planetarium belongs to the singular museum.
4. **(A)** Whenever my relatives come over, we need to order extra food.
The relatives are doing the action of coming over, not possessing anything, so no apostrophe is needed.
5. **(A)** Humpback whales love to swim in the open ocean.
The whales are acting as a subject, not possessing anything, so no apostrophe is required.
6. **(A)** The Broadway show's sets are difficult to move.
The sets belong to the show; the sets do not possess anything.
7. **(A)** When the new coach helped the men's soccer team, he made significant adjustments to the lineup.
Since "men" is already plural, put the apostrophe before the *s*.
8. **(B)** As you read the joint paper by the scientists, note how Watson and Crick's results match their hypothesis.
Since Watson and Crick collectively own the results, just put an apostrophe before the *s* in the final name.
9. **(B)** His backpack needs its straps repaired.
Show possession with the pronoun "it" by *not* using the apostrophe.
10. **(A)** The three farmers' fields encompassed over 500 acres.
Three farmers collectively own the fields, so show possession by putting an apostrophe after the *s*.

Parentheses

Parentheses () do not affect the grammar and meaning of the surrounding sentence.

Without Parentheses	With Parentheses
Once I finish the test, I will read my book for fun.	Once I finish the test (it should take about 30 minutes), I will read my book for fun.
Your next-door neighbor is really nice.	Your next-door neighbor (the one with the unusual mailbox) is really nice.
My teacher gave everyone the opportunity to earn extra credit after the difficult test.	My teacher gave everyone the opportunity to earn extra credit after the difficult test (only a handful of students took advantage of it).

In all the above examples, the parentheses do not affect the usage of the commas and periods that surround them.

Parentheses Practice—select the better sentence out of the two options.

1. (A) The large dog eats quite a bit of food each day (mainly food from a bag).
(B) The large dog eats quite a bit of food each day (mainly food from a bag.)
2. (A) When you eat breakfast (considered the most important meal of the day,) you have energy for several hours.
(B) When you eat breakfast (considered the most important meal of the day), you have energy for several hours.
3. (A) Cricket (once an Olympic game,) is one of my favorite sports.
(B) Cricket (once an Olympic game) is one of my favorite sports.

Answers

1. **(A)** The large dog eats quite a bit of food each day (mainly food from a bag).
Put the period outside of the parentheses since the parentheses will not affect the surrounding punctuation.

2. **(B)** When you eat breakfast (considered the most important meal of the day), you have energy for several hours.
Have the comma outside of the parentheses.
3. **(B)** Cricket (once an Olympic game) is one of my favorite sports.
There is no need for a comma within the parentheses since the parentheses already provide a needed pause.

Question Marks

Do use a question mark (?) at the end of a sentence that directly asks a question.

- Why did you bring that toy to school with you?
- What is he planning on doing in the future?
- “Who is knocking at the door?” my father asked.

Don’t use a question mark if the sentence *indirectly* asks a question.

- I would like to find out who my teacher will be.
- He is excited to find out what happens next in the play.
- The article addresses the central question of whether nature or nurture ultimately has a greater impact.

Question Mark Practice—select the better sentence out of the two options.

1. (A) If you want to do well in class, be sure to ask your teacher questions?
(B) If you want to do well in class, be sure to ask your teacher questions.
2. (A) Where is the nearest subway station.
(B) Where is the nearest subway station?
3. (A) While many students are quiet in class, I prefer to ask my teacher what I need to know.
(B) While many students are quiet in class, I prefer to ask my teacher what I need to know?

✓ Answers

1. **(B)** If you want to do well in class, be sure to ask your teacher questions.
This is an indirect question, so no question mark is needed.
2. **(B)** Where is the nearest subway station?
This is a direct question, so use a question mark.
3. **(A)** While many students are quiet in class, I prefer to ask my teacher what I need to know. This is an indirect question, so no question mark is needed.

Punctuation Practice Questions

Exercise 1

1. I recently moved to a new building, and I am not so sure about some of the people who live there. _____ quite a bit of noise when he walks around.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) The man who lives in the apartment above me makes
 - (B) The man, who lives in the apartment above me makes
 - (C) The man, who lives in the apartment above me, makes
 - (D) The man who lives in the apartment, above me makes
2. I spoke to my teacher, and she gave me some good advice. “To do well on the SAT, be sure to work on improving several key _____ reasoning, and essay editing.”

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) skills, reading comprehension, quantitative
- (B) skills: reading comprehension quantitative
- (C) skills—reading comprehension, quantitative
- (D) skills; reading comprehension, quantitative

3. The weather is lovely—there is a gentle breeze, mild temperature, and no precipitation. _____ a great afternoon to read a book for pleasure.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) Its
- (B) It's
- (C) Its'
- (D) It

4. The area of the park for adults had a botanical garden, a koi pond, and several artistic rock formations. The _____ playground, on the other hand, had some enormous slides and swings.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) children's
- (B) childrens'
- (C) childrens
- (D) childs'

5. My history teacher brings history to _____ activities, guest speakers, and discussions about controversial topics. It is truly exciting to be a part of her class.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) life with stimulating,

- (B) life with: stimulating
- (C) life with; stimulating
- (D) life with stimulating

6. I came to an important realization as I worried about saving enough money for the future. Some of the best things in _____ completely free.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) life, sunshine, fresh air, and starlit nights are
- (B) life—sunshine, fresh air, and starlit nights—are
- (C) life (sunshine, fresh air, and starlit nights—are
- (D) life—sunshine, fresh air, and starlit nights, are

7. When you go shopping, please buy sugar, flour, and butter at the grocery; antacids, bandages, and a thermometer at the _____ screwdriver, and some sandpaper from the hardware store. Please come back with whatever change remains.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) pharmacy, and a hammer, a
- (B) pharmacy: and a hammer a
- (C) pharmacy, and a hammer a
- (D) pharmacy; and a hammer, a

8. As the human resources officer was immersed in making changes to the employee _____ neglected to enforce the policies already on the books. Ultimately, he was not very effective in his job.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) manual, he
- (B) manual he
- (C) manual. He
- (D) manual; he

9. While surfing the Internet, John found that _____ been found in a nearby city. He was overjoyed to know that his companion of many years was safe and sound.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) Sprinkles his missing pet cat, had
- (B) Sprinkles, his missing pet cat, had
- (C) Sprinkles, his missing pet cat had
- (D) Sprinkles his missing pet cat had

10. Mitchell wrote an excellent _____ had it published in a journal. His family members were thrilled that the talents he had worked so long to fine-tune were at last being recognized by the public.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) poem; he
- (B) poem, he
- (C) poem he
- (D) poem, he,

Answer Explanations

1. (A) It is not just any man but specifically the man who lives in the apartment above the narrator who makes noise. Since this description is essential to identifying the subject of the second sentence, there is no need for any commas to break this up.

2. **(C)** The dash provides a heavy pause before the list of the skills, each of which is separated by a comma. Choice (A) does not have a strong enough punctuation, like a colon or dash, before the list. Choice (B) does not have a comma separating the first and second items in the list. Choice (D) incorrectly uses a semicolon because what follows the semicolon is not a complete sentence.
3. **(B)** “It’s” the contraction for “it is,” making it the correct choice. “Its” shows possession, “its” is always incorrect, and “it” does not have the needed verb.
4. **(A)** With a word like “children” that is already plural, you can show possession by adding an apostrophe and an “s.” Choices (B) and (C) would not correctly demonstrate possession, and (D) uses the incorrect plural version of “child.”
5. **(D)** The other options provide unnecessary breaks, while choice (D) allows the phrase to properly flow.
6. **(B)** When setting aside a parenthetical phrase, it is necessary to use the same punctuation to start and finish the parenthetical phrase. Choices (C) and (D) mix and match the beginning and ending punctuation, and choice (A) does not have punctuation after the end of the parenthetical phrase. Only choice (B) begins and ends the parenthetical phrase with consistent punctuation.
7. **(D)** This option correctly uses a semicolon to separate the three sets of listed items, each of which has commas within the list. The semicolon is used in this way to help avoid confusion about the separation of listed items, which would result if commas were used in this situation.
8. **(A)** This option correctly separates the dependent introductory clause from the independent clause with a comma. Choice (B) has no separation. Choices (C) and (D) would have to have a complete sentence before the punctuation to be correct.

9. **(B)** This option puts the clarification of the identity of “Sprinkles” off to the side by surrounding it with commas. The other options do not separate this phrase from the rest of the sentence.
10. **(A)** The semicolon separates the two independent clauses from one another. A comma is insufficient when used without a conjunction to separate two independent clauses.

Exercise 2

1. The interconnectedness between mental and physical health has been consistently shown in a variety of fields in research. _____ causes relatively minor physical ailments like headaches, digestive issues, and muscle tension.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) In the short term mental stress, typically
 - (B) In the short term, mental stress typically
 - (C) In the short term; mental stress typically
 - (D) In the short term, mental stress, typically
2. The most remarkable fact in connection with the season was the earlier _____ greatly delayed arrival. This was probably due almost entirely to the unusual weather conditions that seemed to prevail throughout the South during March and early April, affecting the migration of these birds.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) migrant’s,
- (B) migrant’s,
- (C) migrant
- (D) migrants’

3. A parasitic relationship is between two _____ of the organisms benefits while the other is harmed. Parasitic relationships are often associated with internal parasites like worms or some species of mites, but parasitic relationships are not limited to organisms residing within a host.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) organisms, one
 - (B) organisms—one
 - (C) organisms, while one
 - (D) organisms. If one
4. With health care professionals more needed than ever, hospitals and universities are working to attract students to their health care programs. Students often head into either a nursing or premed track without _____ there are many more jobs in healing beyond (or better yet, between) those two positions.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) realizing however that
 - (B) realizing however, that
 - (C) realizing, however, that
 - (D) realizing; however that
5. Whether they like it or dislike it, most Americans are familiar with the concept of a _____ in to save a large company that is floundering. The government does this primarily to try to save the economy from potentially crushing bankruptcies of giant corporations that employ thousands of people.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) government bailout: the government swoops
- (B) government bailout, the government swoops
- (C) government; bailout the government swoops
- (D) government bailout the government—swoops

6. Good health care practitioners should be able to find work in nearly any corner of the United _____ pay in less desirable regions like rural areas and other underserved communities.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) States, moreover, they can earn higher
- (B) States: moreover they can earn higher
- (C) States, moreover they can earn higher
- (D) States; moreover, they can earn higher

7. The amount of time spent in making observations during the past _____ Observations were typically made independently by each of the writers and on lands differing somewhat in general character.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) season, is significant.
- (B) season is significant.
- (C) season is, significant.
- (D) season—is significant.

8. The migration of birds at Raleigh, N.C., during the spring of 1915 was so unusual that it is believed that a short _____ be of interest to the readers of *Bird-Lore*.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) account, together with a list of the records, will
- (B) account, together with a list of the records will
- (C) account—together with a list of the records, will
- (D) account together with a list of the records; will

9. Upon hatching, a baby European cuckoo's first instinct is to empty the nest. _____ back is perfectly shaped to scoop up other eggs and eject them from the nest.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) Its'
- (B) Its
- (C) It's
- (D) It is

10. Like the mental benefits, and thus physical benefits, that have been found from living in close-knit _____ are many activities that are known to promote physical health due to their impact on mental health.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) communities, there
- (B) communities there
- (C) communities; there
- (D) communities: there

Answer Explanations

1. **(B)** This option correctly places a comma after the introductory phrase, separating the dependent clause from the independent clause that follows. Choice (A) would interrupt the independent clause, separating its subject, “mental stress,” from the remainder of the

sentence. Choice (C) incorrectly uses a semicolon after a dependent clause—a semicolon must have an independent clause on either side of it. Choice (D) has too many commas.

2. **(D)** Based on the context in the second sentence, there are multiple birds that are migrating. So, show possession of the “arrival” by putting the apostrophe after “migrants.” It is not choice (A) or (B) since there are multiple migrants, and it is not choice (C) because this does not show possession.
3. **(B)** Use a dash before the clarification of the relationship between the two organisms since it provides a heavy pause. Choice (A) is a comma splice. Choice (C) incorrectly uses “while” to show a contrast. Choice (D) would result in a sentence fragment for the second part.
4. **(C)** The transitional word “however” should be surrounded with commas since the sentence would still be logical if this word were removed. Choices (A) and (B) do not have enough commas, and choice (D) incorrectly uses a semicolon since there is not a complete sentence after the semicolon. Moreover, there is no comma after “however” in choice (D).
5. **(A)** The colon is appropriate in this case because there is a complete sentence before it and a clarification after it. Choice (B) would result in a comma splice. Choice (C) would not have a complete and logical sentence after the semicolon, and choice (D) has a pause at an awkward spot.
6. **(D)** When joining two sentences with a conjunctive adverb like “moreover,” you need a semicolon before the adverb and a comma after. Choice (D) is the only option that joins these sentences in this way.
7. **(B)** Do not separate the subject “the amount of time spent in making observations during the past season” from the verb “is.” All the other options give an unnecessary pause.

8. (A) Surround the parenthetical phrase, “together with a list of the records,” with commas. Choice (B) only begins the parenthetical phrase with a comma, but does not have one at the end. Choice (C) is inconsistent in how it starts and finishes the parenthetical punctuation. And choice (D) incorrectly uses a semicolon when no complete sentence follows it.
9. (B) “Its” is the correct form of the possessive for the bird’s back. Choice (A) would never be correct, and choices (C) and (D) would signify “it is” instead of the possessive.
10. (A) A comma will correctly separate the long dependent clause from the independent clause that follows. Choice (B) provides no pause, and choices (C) and (D) would need a complete sentence preceding their punctuation.

Sentence Structure and Organization

Parallelism

Even though the meaning of a sentence may be clear, unless it is written in a way that has stylistic consistency, it will not flow how it should. Have stylistic consistency by looking out for *parallel structure*.

➤ Example 1

Incorrect: Two of my hobbies are riding bicycles and to watch movies.

Correct: Two of my hobbies are riding bicycles and **watching** movies.

Explanation: Maintain the same way of describing the hobbies so that the sentence has a parallel structure.

➤ Example 2

Incorrect: Covered in mud, leaves, and in grass, he really needed a shower.

Correct: Covered in mud, leaves, and grass, he really needed a shower.

Explanation: If all the items in the list started with “in,” then it would be fine to maintain that phrasing. Since the “in” that goes with “mud” also goes with “leaves,” it can also apply to “grass” so there is no need to have “in” again.

Parallelism Practice—select the better sentence out of the two options.

1. (A) Choose a teacher to write your letter of recommendation who knows you well, likes the work you have done, and has the time to do a good job.
(B) Choose a teacher to write your letter of recommendation who knows you well, likes the work you have done, and time to do a good job.
2. (A) To win or losing is not really important—just enjoy the game.
(B) Winning or losing is not really important—just enjoy the game.
3. (A) Neither the children nor the adults were ready to leave the amusement park.
(B) Neither the children or those who were adults were ready to leave the amusement park.
4. (A) To get the most out of class, listen carefully, write detailed notes, and ask pointed questions.
(B) To get the most out of class, listen carefully, write detailed notes, and asking pointed questions.
5. (A) Dressed in tuxedos, ballgowns, and additionally in jewels, the celebrities were ready for the awards banquet.
(B) Dressed in tuxedos, ballgowns, and jewels, the celebrities were ready for the awards banquet.
6. (A) Having a diversified portfolio, including investments in domestic growth stocks and international items, is a sound financial strategy.

- (B) Having a diversified portfolio, including investments in domestic growth stocks and international value stocks, is a sound financial strategy.
7. (A) Ben, a country music lover, and Kim, an appreciator of the musical genre of classical, surprisingly found a radio station they both liked.
(B) Ben, a country music lover, and Kim, a classical music lover, surprisingly found a radio station they both liked.
8. (A) Be sure to pack these items for the bus trip: delicious snacks, entertaining movies, and good books.
(B) Be sure to pack these items for the bus trip: delicious snacks, movies that you find entertaining, and good books.
9. (A) To clean his apartment, Henry vacuumed the floor and dusting the shelves.
(B) To clean his apartment, Henry vacuumed the floor and dusted the shelves.
10. (A) My brother, a football fan, and my sister, a baseball fan, both enjoy watching sports in autumn.
(B) My brother, a football fan, and my sister, who is a baseball fan, both enjoy watching sports in autumn.

✓ **Answers**

1. **(A)** Choose a teacher to write your letter of recommendation who knows you well, likes the work you have done, and has the time to do a good job.
Use “has the” with the final item in the list since all the listed items begin with a verb.
2. **(B)** Winning or losing is not really important—just enjoy the game.
“Winning” and “losing” use the same phrasing.
3. **(A)** Neither the children nor the adults were ready to leave the amusement park.

“Neither” and “nor” go together, while “either” and “or” go together.

4. **(A)** To get the most out of class, listen carefully, write detailed notes, and ask pointed questions.
“Asking” is not parallel with the other verbs.
5. **(B)** Dressed in tuxedos, ballgowns, and jewels, the celebrities were ready for the awards banquet.
Using “additionally in” interrupts the parallel structure.
6. **(B)** Having a diversified portfolio, including investments in domestic growth stocks and international value stocks, is a sound financial strategy.
“International items” does not match the previous example of “domestic growth stocks.”
7. **(B)** Ben, a country music lover, and Kim, a classical music lover, surprisingly found a radio station they both liked.
Simply using “lover” is sufficient and maintains the parallel structure.
8. **(A)** Be sure to pack these items for the bus trip: delicious snacks, entertaining movies, and good books.
Maintain the parallel listing structure of *adjective-noun* by saying “entertaining movies.”
9. **(B)** To clean his apartment, Henry vacuumed the floor and dusted the shelves.
“Vacuumed” and “dusted” maintain a parallel style.
10. **(A)** My brother, a football fan, and my sister, a baseball fan, both enjoy watching sports in autumn.
Since the first parenthetical in the list does not have “who is,” maintain that style for the next parenthetical.

Modifier Placement

Make sure sentences follow a logical order, with descriptions and subjects in a clear sequence.

Be certain that the *literal* meaning matches up with the *intended* meaning.

► Example 1

Incorrect: After completing the long hike, a three-hour nap did Xavier take.

Correct: After completing the long hike, Xavier took a three-hour nap.

Explanation: The first sentence does not name the subject until the very end, making it difficult to follow. The second sentence makes it clear that Xavier took the hike.

► Example 2

Incorrect: Once we left the stadium, traffic was directed.

Correct: Once we left the stadium, the police directed the traffic.

Explanation: The first sentence is vague as to who or what directed the traffic. The second sentence makes it clear that the police did so.

► Example 3

Incorrect: Your book will not become damaged, covered with a brown paper book cover.

Correct: Your book, covered with a brown paper book cover, will not become damaged.

Explanation: The description of the book—that it is covered with a brown paper book cover—should come after the book, as the second sentence does.

Modifier Placement Practice—select the better sentence out of the two options.

1. (A) I helped when dinner was over to clear the table.
(B) When dinner was over, I helped to clear the table.
2. (A) The deer encountered a bear eating grass in the meadow.
(B) While eating grass in the meadow, the deer encountered a bear.
3. (A) My friend Jordan, an art aficionado, loves to go to the latest museum openings.
(B) My friend Jordan loves to go to the latest museum openings, an art aficionado.
4. (A) Widely embraced as an ethical practice, recycling is required in many municipalities.
(B) Recycling is required in many municipalities, widely embraced as an ethical practice.
5. (A) The 1960s (a decade of much social upheaval) made my relatives the people they are today.
(B) The 1960s made my relatives the people (a decade of much social upheaval) they are today.
6. (A) My classmate is very generous when I forget my own, always shares his extra pencils and erasers with me.
(B) My classmate is very generous, since he always shares his extra pencils and erasers with me when I forget my own.
7. (A) Despite my reservations about going on the trip, I ended up having a wonderful time.
(B) I ended, despite my reservations about going on the trip, up having a wonderful time.
8. (A) Astrophysicists, a mysterious force in the universe, are excited to discover the true identity of dark energy.
(B) Astrophysicists are excited to discover the true identity of dark energy, a mysterious force in the universe.
9. (A) The diameter of a circle goes through the center of the circle, which is twice the circle's radius.

- (B) The diameter of a circle, which is twice the circle's radius, goes through the center of the circle.
10. (A) Even though they were delicious, the habanero peppers were so spicy they hurt my eyes.
(B) The habanero peppers were so spicy they hurt my eyes, even though they were delicious.

✓ Answers

1. (B) When dinner was over, I helped to clear the table.
This makes it clear that the narrator helped with clearing the table *after* dinner was over.
2. (B) While eating grass in the meadow, the deer encountered a bear.
This makes it clear that it is the deer that is eating grass, not the bear.
3. (A) My friend Jordan, an art aficionado, loves to go to the latest museum openings.
Jordan, not the museum openings, is the art aficionado (someone who appreciates art).
4. (A) Widely embraced as an ethical practice, recycling is required in many municipalities.
The ethical practice is recycling, not municipalities.
5. (A) The 1960s (a decade of much social upheaval) made my relatives the people they are today.
The 1960s, not the people, were the decade of much social upheaval.
6. (B) My classmate is very generous, since he always shares his extra pencils and erasers with me when I forget my own.
This sentence makes sense, putting the reason the classmate is generous immediately after stating that he is generous, and making the subject "he" clear in the later part of the sentence.

7. **(A)** Despite my reservations about going on the trip, I ended up having a wonderful time.
The other option breaks up the phrase “I ended up,” making the sentence confusing.
8. **(B)** Astrophysicists are excited to discover the true identity of dark energy, a mysterious force in the universe.
Dark energy, not astrophysicists, can logically be described as a mysterious force in the universe.
9. **(B)** The diameter of a circle, which is twice the circle’s radius, goes through the center of the circle.
This makes it clear that the diameter is twice the circle’s radius, not that the circle is twice its own radius.
10. **(A)** Even though they were delicious, the habanero peppers were so spicy they hurt my eyes.
The habanero peppers were delicious, not the narrator’s eyes.

Logical Comparisons

When making comparisons, be sure that the things being compared match one another in their type and number. As with other sentence structure and organization ideas, be sure that the *intended* meaning corresponds to the *literal* meaning.

➤ Example 1

Incorrect: The salaries at the first business are comparable to the other business.

Correct: The salaries at the first business are comparable to **those of** the other business.

Explanation: The salaries, not the businesses, are what are being compared. Putting “those of” in the second part of the sentence makes this clear.

➤ Example 2

Incorrect: Pollen affects me the same way that ragweed.

Correct: Pollen affects me the same way that ragweed **does**.

Explanation: The ways that pollen and ragweed affect the narrator are what are being compared. Without putting “does” at the end, the sentence would compare “pollen affects” to the noun “ragweed.”

Logical Comparisons Practice—select the better sentence out of the two options.

1. (A) The downtown park in my city is better than any park.
(B) The downtown park in my city is better than any other park.
2. (A) Your assignment is better than him.
(B) Your assignment is better than his.
3. (A) The principal at my middle school was tougher than the one at my elementary school.
(B) The principal at my middle school was tougher than my elementary school.
4. (A) I hope that my job application is better than the other applicants.
(B) I hope that my job application is better than the other applicants’.
5. (A) Nurse practitioners provide many of the same treatments that doctors.
(B) Nurse practitioners provide many of the same treatments that doctors provide.
6. (A) I was disappointed to learn that students who did less work in the class earned better grades than students who put in more effort.
(B) I was disappointed to learn that students who did less work in the class earned better grades than students of effort.

7. (A) Relative to the collection of my local town's art museum, that of the Louvre is far more impressive.
(B) Relative to the collection of my local town's art museum, the Louvre is far more impressive.
8. (A) Algebra is better understood as a study of mathematical principles than simply studying letters.
(B) Algebra is better understood as a study of mathematical principles than simply a study of letters.
9. (A) A general is typically more experienced than a lieutenant.
(B) A general is typically more experienced than a lieutenant does.
10. (A) I find walking far easier than running.
(B) I find walking far easier than the times in which I run.

✓ **Answers**

1. **(B)** The downtown park in my city is better than any other park.
Without the "other," the sentence would be comparing the downtown park to itself.
2. **(B)** Your assignment is better than his.
Compare the assignment to another assignment, not to a person.
3. **(A)** The principal at my middle school was tougher than the one at my elementary school. Compare the principal to another principal, not to a school.
4. **(B)** I hope that my job application is better than the other applicants'.
Using the apostrophe at the end of "applicants" makes the word a substitute for the "applications of other applicants," giving us a logical comparison.
5. **(B)** Nurse practitioners provide many of the same treatments that doctors provide.

Compare the providing of the nurse practitioners to the providing of the doctors, not the doctors themselves.

6. **(A)** I was disappointed to learn that students who did less work in the class earned better grades than students who put in more effort.
Keep the phrasing of “who did less work” consistent by using the verb “put in.”
7. **(A)** Relative to the collection of my local town’s art museum, that of the Louvre is far more impressive.
“That of” provides a stand-in for the collection of the Louvre, so that you are comparing a collection of one museum to the collection of the other.
8. **(B)** Algebra is better understood as a study of mathematical principles than simply a study of letters.
“A study of” is consistent with the earlier phrasing, not “studying.”
9. **(A)** A general is typically more experienced than a lieutenant.
The general is described with the adjective “experienced,” and there is no need to use a verb like “does.”
10. **(A)** I find walking far easier than running.
This comparison concisely maintains the style, ending in “ing.” The other option is overly wordy and confusing.

Sentence Structure and Organization Practice Questions

1. Michael Jordan, winner of six World Championships, is _____. It is incredible that Jordan accumulated so many titles despite taking a hiatus from basketball for several years to pursue his interest in baseball.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) as a basketball player who is incredible that is universally regarded.
- (B) regarded as a basketball player universally and incredibly.
- (C) universally regarded as an incredible basketball player.
- (D) as is universally regarded a basketball player with incredible qualities.

2. The playoff match was not even close—the Tigers walloped the Lions by 20 points. Undoubtedly, the coach of the Tigers is better than _____

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) the Lions.
- (B) the coach of the Lions.
- (C) theirs.
- (D) the other team.

3. The restaurant was very serene, with only a handful of diners present. _____ He took advantage of the quiet to think about his plans for the future.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) My friend, chewing quietly, pensively enjoyed his dinner.
- (B) My friend pensively enjoyed his dinner chewing quietly.
- (C) My friend enjoyed his chewing quietly dinner pensively.
- (D) Chewing quietly, his dinner my friend pensively enjoyed.

4. In the adventure movie, they ran through the forest, fought fierce predators, and _____ the evil villains. I rated the film five stars for excitement but only three stars for the dialogue.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) stop
- (B) stopping
- (C) will stop
- (D) stopped

5. In the gym, on the field, _____ Hannah acted like a true champion. Her diligence and strength served as an excellent example for both her classmates and teammates.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) and the classroom,
- (B) and in the classroom,
- (C) and classroom,
- (D) and classroom as well,

6. The forecasts throughout the week predicted, high winds, heavy precipitation, and freezing temperatures. However, the weather ended up being fine; it _____ hailed. We were immensely relieved.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) either snowed nor
- (B) either snowed and
- (C) neither snowed and
- (D) neither snowed nor

7. Out of everyone in my city, I am _____ at solving crossword puzzles. My friend, on the other hand, is widely recognized as the best chess player in town.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) good
- (B) better
- (C) the best
- (D) the goodest

8. Upon receiving the notice of losing his job, _____ He took all of his belongings with him in a small box so that the next employee could use his cubicle.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) his desk was cleared out by him.
- (B) he cleared out his desk.
- (C) the desk cleared.
- (D) the desk was cleared.

9. The brand-new _____ Give the affordable price, I decided to buy the extended warranty and an advanced headset.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) phone, which cost only \$30, was covered under the cell phone plan I found online.
- (B) phone was covered under the cell phone plan I found online, which cost only \$30.
- (C) phone that cost only \$30 was under the cell phone plan covered, that is, the one I found online.
- (D) phone which cost only \$30 was online under the cell phone I found covered.

10. I find that driving the sports car is both exhilarating _____. My friends enjoy going for rides with me, especially when I retract the roof and turn the car into a convertible.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) and relaxed.
- (B) and relaxing.
- (C) or relaxing.
- (D) or relaxed.

Answer Explanations

1. **(C)** This option puts the words in the most logical sequence. The other options put the words in sequences that are not very clear.
2. **(B)** By replacing the underlined portion with “the coach of the Lions,” the sentence will now make a logical comparison of a coach to a coach. The other options compare the coach to illogical entities.
3. **(A)** Choice (A) is the only option that correctly has “chewing quietly” next to what it should modify—“My friend.” The other options put this phrase in an awkward spot.
4. **(D)** “Stopped” is the only option that maintains the parallel structure by having a past tense verb. It is consistent with the other verbs “ran” and “fought.” The other choices do not maintain parallelism.
5. **(B)** The other phrases in this sentence start with a preposition like “in” or “on.” Choice (B) is the only option that begins in that similar fashion.
6. **(D)** Based on the preceding sentence and the transition “however,” this sentence needs to say that no bad weather happened. “Neither . . . nor” is the appropriate way to express this idea. With “either” and “neither,” use “or” not “and.”

7. **(C)** Since there are surely three or more people in the city, the superlative “best” is the correct word to express this comparison. “Good” is typically used to describe a single object, “better” is used for comparing two objects, and “goodest” is not a word.
8. **(B)** This option puts the sentence in an active voice and has the words in a logical order. Choices (A) and (D) invert the word order and choice (C) would not make sense since the desk is not doing the clearing.
9. **(A)** The phrase “which cost only \$30” is nonessential to the sentence and can be surrounded with commas. Moreover, the phrase needs to modify “phone” since that is the item that has the cost of \$30. Choice (A) is the only option that does both tasks.
10. **(B)** This maintains parallelism with “exhilarating” by having the same ending of “ing.” Also, with the word “both,” you need to use “and” instead of “or.”

Transitions

The SAT tests your proficiency with transitional words—words like “but,” “also,” and “because” that connect phrases and sentences together. An understanding of transitional words will ensure that your writing is well-organized. Here is a list of some of the most common transitional words you will encounter on the SAT:

General Meaning	Transitional Words
Additional Information	Also, and, besides, further, furthermore, in addition, what’s more
Cause and Effect	As a result, because, consequently, therefore, thus, to that end
Clarification	At any rate, in other words, in fact
Comparison	Likewise, similarly, by the same token
Contrast	After all, alternately, although, but, by contrast, even though, however, instead, meanwhile, nevertheless, nonetheless, on the other hand, rather, still, whereas
Give an Example	For example, for instance

Obviously	Of course
Time Sequence	Eventually, finally, in the first place, next, ultimately
Typically	Traditionally

► Example 1

Incorrect: The kitchen had virtually no food in it. Also, we managed to make dinner.

Correct: The kitchen had virtually no food in it. **Still**, we managed to make dinner.

Explanation: Even though the kitchen did not have much food, the group was still able to make dinner. Thus, a contrast is needed between the two sentences—“Still” works well. When working through transition questions, be certain to consider the surrounding context so you can determine the best logical relationship.

In the above example, you needed to look at the sentence before and after the transitional word. In some sentences, the transition is based just on what comes after the transitional word, like “Although I was excited to watch the movie, I had difficulty finding time to do so.” Err on the side of considering a bit too much context just to be sure you fully understand what logical relationship is needed.

► Example 2

When school begins in the fall, seniors often ask their past teachers to write letters of recommendation on their behalf. The best teachers are typically inundated with requests, and usually have to limit the number of letters they can write. _____ it is a good idea to ask teachers in the spring or summer for letters of recommendation so that the teachers have adequate time to do them.

Which choice completes the text with the most logical transition?

- (A) Also,
- (B) For instance,
- (C) Therefore,
- (D) Furthermore,

Explanation: The correct answer to this question is **(C)**, “Therefore.” This is the only option that provides a cause-and-effect relationship between the first two sentences and the final sentence of the paragraph. A cause-and-effect relationship is necessary here since it is because good teachers are flooded with letter of recommendation requests that it is sensible to ask teachers earlier to write letters on your behalf.

Transitions Practice—select the better sentence(s) out of the two options.

1. (A) Even though I had plenty of sleep, I still felt tired.
(B) Consequently I had plenty of sleep, I still felt tired.
2. (A) A part-time job during high school is a great way to make extra money. Furthermore, it can help you develop skills that will serve you well in college and in your career.
(B) A part-time job during high school is a great way to make extra money. In contrast, it can help you develop skills that will serve you well in college and in your career.
3. (A) When making bread, first preheat the oven. Therefore, put the well-kneaded dough into the oven to bake.
(B) When making bread, first preheat the oven. Next, put the well-kneaded dough into the oven to bake.
4. (A) The yard was completely covered with weeds. Nevertheless, the gardener happily tackled the weeding and turned the yard into a beautiful site.
(B) The yard was completely covered with weeds. Also, the gardener happily tackled the weeding and turned the yard into a beautiful site.
5. (A) Majoring in two different areas may allow for a natural synergy between subjects. For instance, a business major with an engineering

major could help you learn both how to make a product and how to market it.

(B) Majoring in two different areas may allow for a natural synergy between subjects. Whereas a business major with an engineering major could help you learn both how to make a product and how to market it.

6. (A) He did not have a good reason to run for office, and, by the same token, he did not have a reason to avoid running.
(B) He did not have a good reason to run for office, and, in the first place, he did not have a reason to avoid running.
7. (A) A perfect score would, of course, be preferable; thus, a 99 out of 100 is truly excellent.
(B) A perfect score would, of course, be preferable; however, a 99 out of 100 is truly excellent.
8. (A) We did not do very well in the game; consequently, our coach made us run extra laps.
(B) We did not do very well in the game; and our coach made us run extra laps.
9. (A) The roller coaster had an awesome first hill, and what's more, it had three incredible loops.
(B) The roller coaster had an awesome first hill and despite this, it had three incredible loops.
10. (A) The wildlife sanctuary had elephants and rhinos. In contrast, it had zebra, giraffes, and water buffalo.
(B) The wildlife sanctuary had elephants and rhinos. Further, it had zebra, giraffes, and water buffalo.
11. (A) His anger at his neighbor was understandable. Therefore, it was no justification for vandalism of his neighbor's house.
(B) His anger at his neighbor was understandable. However, it was no justification for vandalism of his neighbor's house.

12. (A) The world-renowned orchestra conductor is nonetheless an excellent violinist.
(B) The world-renowned orchestra conductor is likewise an excellent violinist.
13. (A) I did not eat breakfast. As a result, I was really hungry for lunch.
(B) I did not eat breakfast. Moreover, I was really hungry for lunch.
14. (A) Thanksgiving is, in other words, a day on which people eat quite a bit of food.
(B) Thanksgiving is traditionally a day on which people eat quite a bit of food.
15. (A) Her parents did not think she wanted to join the club. In fact, she was the first one to sign up for the club at the school fair.
(B) Her parents did not think she wanted to join the club. Typically, she was the first one to sign up for the club at the school fair.
16. (A) Best friends are forever; despite this, you will stay connected to your best friend over many decades and great distances.
(B) Best friends are forever; in other words, you will stay connected to your best friend over many decades and great distances.
17. (A) At first, the athlete resisted the advice of his coach. Ultimately, he took the coach's advice and improved immensely.
(B) Initially, the athlete resisted the advice of his coach. At first, he took the coach's advice and improved immensely.
18. (A) I am excited for the first day of school. On the other hand, I am worried about a pop quiz over the summer reading.
(B) I am excited for the first day of school. Consequently, I am worried about a pop quiz over the summer reading.
19. (A) We climbed up the mountain and still reached the summit.
(B) We climbed up the mountain and eventually reached the summit.
20. (A) The doctor said you should eat more fruits and vegetables.
Therefore, you should come to the farmer's market to buy some

healthy produce.

(B) The doctor said you should eat more fruits and vegetables.

Whereas you should come to the farmer's market to buy some healthy produce.

✓ **Answers**

1. **(A)** Even though I had plenty of sleep, I still felt tired.
“Even though” shows contrast between having plenty of sleep and still feeling tired.
2. **(A)** A part-time job during high school is a great way to make extra money. Furthermore, it can help you develop skills that will serve you well in college and in your career.
“Furthermore” makes sense since the idea of skill development would be an additional benefit of having a part-time job.
3. **(B)** When making bread, first preheat the oven. Next, put the well-kneaded dough into the oven to bake.
“Next” demonstrates the sequence of events that one would find in a recipe.
4. **(A)** The yard was completely covered with weeds. Nevertheless, the gardener happily tackled the weeding and turned the yard into a beautiful site.
“Nevertheless” shows a contrast between the fact that the yard was covered with weeds and the fact that the gardener could still make the yard into something beautiful.
5. **(A)** Majoring in two different areas may allow for a natural synergy between subjects. For instance, a business major with an engineering major could help you learn both how to make a product and how to market it.
“For instance” is a logical way to join the two sentences, since the second sentence provides an example of how a double major could make sense.

6. **(A)** He did not have a good reason to run for office, and, by the same token, he did not have a reason to avoid running.
“By the same token” means that the man both had a good reason to run for office *and* had a reason not to run.
7. **(B)** A perfect score would, of course, be preferable; however, a 99 out of 100 is truly excellent.
“However” shows a contrast between the acknowledgement that a perfect score would be better, but that a 99 is still outstanding.
8. **(A)** We did not do very well in the game; consequently, our coach made us run extra laps.
“Consequently” states the cause-and-effect relationship between not doing well in the game and the coach’s decision to make the players run laps.
9. **(A)** The roller coaster had an awesome first hill, and what’s more, it had three incredible loops.
“What’s more” shows that in addition to the awesome first hill, the roller coast had three incredible loops.
10. **(B)** The wildlife sanctuary had elephants and rhinos. Further, it had zebra, giraffes, and water buffalo.
“Further” shows that along with the elephants and rhinos, the sanctuary also had other animals.
11. **(B)** His anger at his neighbor was understandable. However, it was no justification for vandalism of his neighbor’s house.
“However” shows that while the man was understandably angry at his neighbor, he had no good reason to vandalize his neighbor’s home.
12. **(B)** The world-renowned orchestra conductor is likewise an excellent violinist.
“Likewise” shows that the conductor is both excellent with the orchestra and with the piano.
13. **(A)** I did not eat breakfast. As a result, I was really hungry for lunch.

“As a result” shows a direct cause-and-effect relationship between not eating breakfast and being hungry for lunch.

14. **(B)** Thanksgiving is traditionally a day on which people eat quite a bit of food.
“In other words” does not make sense since the sentence is not rephrasing anything; “traditionally” works because the sentence says what typically happens on this holiday.
15. **(A)** Her parents did not think she wanted to join the club. In fact, she was the first one to sign up for the club at the school fair. “In fact” clarifies that despite what her parents thought, the daughter was actually interested in joining the club.
16. **(B)** Best friends are forever; in other words, you will stay connected to your best friend over many decades and great distances.
The part of the sentence after the semicolon clarifies what is meant by the statement that “best friends are forever,” so “in other words” is logical.
17. **(A)** At first, the athlete resisted the advice of his coach. Ultimately, he took the coach’s advice and improved immensely.
This sentence puts the sequence of events in a logical order, with the athlete initially resisting the coach’s advice and eventually following it.
18. **(A)** I am excited for the first day of school. On the other hand, I am worried about a pop quiz over the summer reading.
“On the other hand” suggests a contrast between the excitement of the student and the worry over a quiz.
19. **(B)** We climbed up the mountain and eventually reached the summit.
This option shows a logical sequence of events with “eventually” used to mark the final part of the journey.
20. **(A)** The doctor said you should eat more fruits and vegetables.
Therefore, you should come to the farmer’s market to buy some

healthy produce. “Therefore” shows a cause-and-effect relationship between the doctor’s recommendation about how to eat and the action necessary to acquire the recommended foods.

Transitions Practice Questions

Exercise 1

1. The two friends saw eye to eye on virtually everything, from food to fashion, and from literature to music. When one found something to be funny, the other was _____ amused.

Which choice completes the text with the most logical transition?

- (A) likewise
- (B) specifically
- (C) finally
- (D) meanwhile

2. Electing Maria to be class president was a foregone conclusion. She was popular with virtually every group in school. _____ her speech made a clear and convincing case for her candidacy.

Which choice completes the text with the most logical transition?

- (A) Notwithstanding,
- (B) Immediately,
- (C) Although,
- (D) Moreover,

3. The court proceedings were about to begin without the sole eyewitness to the crime present. The judge _____ summoned the eyewitness to appear at the next court hearing to help get to the bottom of the matter.

Which choice completes the text with the most logical transition?

- (A) in contrast

- (B) still
- (C) accordingly
- (D) despite this

4. The play will be delayed for several minutes so that the ushers can guide the latecomers to their seats. _____ spectators can spend some time checking out the program and enjoying their concessions.

Which choice completes the text with the most logical transition?

- (A) Centrally,
- (B) In the meantime,
- (C) To summarize,
- (D) Furthermore,

5. The meal looked and smelled a bit strange; _____, it tasted delicious. It is often helpful to be open to new experiences, not being afraid to take that first bite.

Which choice completes the text with the most logical transition?

- (A) therefore
- (B) nevertheless
- (C) for this reason
- (D) to that end

6. When you want to chop vegetables, begin by grabbing the ingredients you will need. _____, get the cutting board and knife. Finally, begin chopping the vegetables into the shapes and sizes you need for the dish.

Which choice completes the text with the most logical transition?

- (A) First
- (B) At last
- (C) In short

(D) Second

7. As a father, I try to give my children the best advice I can. _____, I am no expert in psychology. However, I genuinely believe that I have my children's best interests at heart and want to help however possible.

Which choice completes the text with the most logical transition?

- (A) Granted
- (B) Similarly
- (C) Beyond
- (D) Foundationally

8. The squirrel grabbed a large walnut and took it up a tree for storage. Only a few minutes _____ the squirrel returned to grab yet another walnut. With dedication like this, the squirrel should be in excellent shape for a long winter.

Which choice completes the text with the most logical transition?

- (A) afterward
- (B) beyond
- (C) nevertheless
- (D) therefore

9. The baker wanted to make something that would be acceptable for diners with a gluten intolerance. _____ in mind, he found some gluten-free flour and made a wonderful dessert.

Which choice completes the text with the most logical transition?

- (A) Unfortunate
- (B) In fact of purpose
- (C) Truly
- (D) With this object

10. When you write your term paper, be sure to give plenty of examples _____ your primary argument. The grader will carefully examine how strong the support is for your thesis.

Which choice completes the text with the most logical transition?

- (A) with contend
- (B) of claiming
- (C) on advance
- (D) to illustrate

Answer Explanations

1. **(A)** The two friends are similar in all their beliefs, so the transition “likewise” expresses this similarity.
2. **(D)** Maria is popular with everyone and in addition her speech was very convincing. The most appropriate transition is “moreover” since it means “also.” The other options do not convey this relationship.
3. **(C)** “Accordingly” shows a cause-and-effect relationship, which makes sense given that the sole witness was absent and the judge wanted the witness to appear. The other options do not show a cause-and-effect relationship.
4. **(B)** “In the meantime” means that someone can do something else while another thing is happening. The spectators can do other things as they wait for the delayed play to begin, making “in the meantime” an appropriate transition. The other options do not convey this idea.
5. **(B)** “Nevertheless” shows a contrast, unlike the other options. A contrast is appropriate in this context since although the meal seems strange, it ended up tasting quite good.
6. **(D)** The text is outlining the steps that you should take when chopping vegetables. The second step out of the three steps is to get the cutting board and knife, making choice (D) the only logical option.

7. **(A)** “Granted” is synonymous with “it is true that . . .” In this context, the narrator is stating that while he tries to give the children the best possible advice, he may fall short in the quality of the advice since he is not an expert in psychology. The other options do not acknowledge the truth of the situation.
8. **(A)** The squirrel returned “afterward” to get another walnut after initially grabbing and storing one. The other options would not convey the timeline of events.
9. **(D)** “With this object” means “with a goal.” In this context, the baker wants to make something for diners who cannot eat gluten; given this goal, he finds flour that allows him to make something they can enjoy. The other options do not express the appropriate connection.
10. **(D)** The grader is looking for support for the thesis, so it is important “to illustrate” your argument. The other options are grammatically incorrect.

Exercise 2

1. The parasitic European cuckoo decreases the mother bird’s output and, in some cases, kills all offspring, _____ decreasing the host bird’s fitness. On top of reproductive output, the mother bird must put in additional work to feed the equivalent of a nest full of babies that is just one large baby.

Which choice completes the text with the most logical transition?

- (A) however
 - (B) but
 - (C) therefore
 - (D) previously
2. “Ladies and gentlemen of the class of ’97, wear sunscreen. If I could only offer you one tip for the future, that would be it.” _____ begins a well-known commencement speech; the speaker goes on to explain

why his advice about careers and life goals may or may not be helpful to the students, but the advice to wear sunscreen will always be applicable.

Which choice completes the text with the most logical transition?

- (A) Whereas
- (B) Additionally
- (C) Thus
- (D) Also

3. In 1907 when a financial crisis (one of the foreshocks of the panic that would lead to the Great Depression) took place, Morgan took charge. Banks were on the brink of falling apart. People were going to lose their savings; the situation was dire and the government at the time did not have the power to intervene in a meaningful way. _____ Morgan did.

Which choice completes the text with the most logical transition?

- (A) So,
- (B) Additionally,
- (C) Formerly,
- (D) Moreover,

4. The Roseto Effect was first studied in Roseto, Pennsylvania, where there lived a tight-knit community whose diets contained significant levels of fatty acids. _____ members of the town eating high levels of fats, drinking alcohol, and commonly smoking tobacco, the town's residents had significantly lower rates of cardiovascular diseases than those in surrounding areas.

Which choice completes the text with the most logical transition?

- (A) Despite
- (B) Because of the

- (C) Given the
- (D) Whenever

5. While the concept of a government bailout is fairly new, the idea of external powers stepping in to try to boost the economy is not. Prior to the era of governmental intervention, _____ it was big business who worked to protect the economy and with it, their profits.

Which choice completes the text with the most logical transition?

- (A) consequently,
- (B) also,
- (C) due to this,
- (D) however,

6. Easily one of the most distinctive painters associated with the surrealist movement of the early 20th century, Frida Kahlo _____ insisted adamantly throughout her career that she was by no means a surrealist herself.

Which choice completes the text with the most logical transition?

- (A) consequently
- (B) moreover
- (C) accordingly
- (D) nonetheless

7. A good broad range sunscreen can, when used properly, prevent sunburn for hours. _____ if a product has a sun protection factor (SPF) of 30, that means that skin can be exposed for 30 times longer without burning than if no protection was used.

Which choice completes the text with the most logical transition?

- (A) Despite this,
- (B) For example,

- (C) In contrast,
- (D) Also,

8. Despite its sinister and somewhat draconian reputation, electroconvulsive therapy (ECT) is making a rather surprising return in the treatment of chronic clinical depression. Like many of its pharmaceutical counterparts, the exact physiological mechanism responsible for ECT's alleviation of the symptoms of depression remains elusive, _____ its results are inarguably remarkable.

Which choice completes the text with the most logical transition?

- (A) and
- (B) since
- (C) with
- (D) but

9. Sunlight is different from the light that a person experiences from a fire or a light bulb. Sunlight is mostly UV light, which has a much shorter wavelength than the light we turn on when we use the bathroom in the middle of the night. _____ if the earth's protective ozone layer didn't filter out much of the UV light, humans would risk their health just by going about their everyday lives during daylight hours.

Which choice completes the text with the most logical transition?

- (A) Meanwhile,
- (B) Nonetheless,
- (C) Indeed,
- (D) As a result,

10. If school were operated on a year-round basis, student retention of material would be strengthened since it is much easier to forget material over a three-month break than over a two-week one. Material retention is especially vital for subjects like math and foreign language in which more advanced units will not make sense without a sound

basis in the earlier material. _____ if students have more frequent breaks from the rigors of school, they are less likely to burn out.

Which choice completes the text with the most logical transition?

- (A) However,
- (B) Consequently,
- (C) Additionally,
- (D) On the other hand,

Answer Explanations

1. **(C)** This option is the only choice that shows a cause-and-effect relationship between the European cuckoo acting parasitically toward other birds and the resulting decrease in the host bird's overall fitness. Choices (A) and (B) show a contrast, and choice (D) unnecessarily inserts a time sequence indication.
2. **(C)** "Thus" is used to make the idiomatic phrase "Thus begins"; this phrase provides a logical transition between the quotation that started the speech and the clarification of the significance of the speech. It is not choice (A) because there is no contrast, and it is not choices (B) or (D) because this is not an additional piece of information, but a clarification.
3. **(A)** "So" correctly expresses a cause-and-effect relationship between the earlier sentence, which says that there was a dire situation with no government help, and the current sentence expresses that Morgan did intervene. The other options do not express a cause-and-effect relationship.
4. **(A)** "Despite" signifies an oppositional relationship between the first part of the sentence, which states that the diets of the town's residents are not particularly healthy, and the unexpected lack of cardiovascular

disease among the residents. The other options do not convey a contrasting relationship.

5. **(D)** “However” is the appropriate transition in this context, since the sentence points out the contrast between the current era of governmental intervention and an era in the past when privately based bailouts were more commonplace. Choices (A) and (C) would show cause and effect, and choice (B) would be used to list an additional item or idea.
6. **(D)** “Nonetheless” is used to show a contrast between the fact that Frida Kahlo is considered a surrealist by society, yet she did not consider herself a surrealist. Choice (A), “consequently,” and choice (C), “accordingly,” show cause and effect. Choice (B), “moreover,” is synonymous with “also.” This is a good example where you can use the similarities among choices (A) and (C) to eliminate them.
7. **(B)** “For example” is appropriate since the current sentence provides an example of what makes a high-quality sunscreen. It is not choices (A) or (C) because there is not a contrast, and it is not choice (D) because the current sentence provides an example, not simply an extra point.
8. **(D)** The word “but” is the appropriate transition. The sentence contains a contrast—scientists do not know exactly how ECT works, but they do know that the results are remarkable. The transitions in choices (A), (B), and (C) do not indicate a contrast.
9. **(C)** “Indeed” is used to introduce a further point that elaborates on the previous point made; in this case, “indeed” connects the previous sentence that states that sunlight is mostly UV light and the current sentence that underscores the potential danger from UV light to humans. It is not choices (A) or (B) because there is not a contrast, and it is not choice (D) because there is not a cause-and-effect relationship.

10. (C) The word “Additionally” correctly indicates that this sentence builds upon the argument in the previous sentences. Choice (B), “Consequently,” indicates a cause-and-effect relationship. Choice (A), “However,” and choice (D), “On the other hand,” both indicate a contrast.

Rhetorical Synthesis Questions

A new type of question on the Digital SAT is the rhetorical synthesis, or “rhetorical analysis,” question. You will be asked to consider the notes that a student has taken on a topic and determine the best way to use the information in the notes to present or emphasize a particular idea. On questions like these, be sure to really focus on what the question asks so that you can zero in on the most relevant evidence.

► Example

While researching a topic, a student has taken the following notes:

- The classical Humanist ideal of human individualism can be represented by Leonardo da Vinci’s “Vitruvian Man.”
- The Vitruvian Man was an emblem of Humanism and the source for the civilization model that assumes Europe is not just a location, but a universal standard of humankind.
- Posthumanism tends to turn away from the nature and culture binary and questions the distinctions between what is considered human and nonhuman.
- Posthumanism rejects individualism by discouraging human-centered, or self-centered, thought, and instead urges interconnection between self, others, and nonhuman others.

The student wants to emphasize what makes Humanism different from Posthumanism. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) Humanism focuses on a concern for others, while Posthumanism embraces self-centeredness.
- (B) Humanism argues for individualism, while Posthumanism rejects it.
- (C) Humanism focuses on geography, while Posthumanism is concerned with politics.
- (D) Humanism advocates compassion for all living things, while Posthumanism focuses on the needs of humans alone.

✓ Answers

The correct answer is choice (B). Focus on the specific question: “The student wants to emphasize what makes Humanism different from Posthumanism.” Look at the bullets to determine what makes the two ideas different. The first bullet shows that individualism is associated with classical Humanism. The final bullet shows that Posthumanism rejects individualism. So, choice (B) is correct in articulating the differences between these two ideas. It is not choice (A) because this gets the two ideas backwards. It is not choice (C) because Humanism is not concerned with geography whatsoever, and Posthumanism is only loosely related to politics. It is not choice (D) because Humanism focuses on individualism rather than extensive compassion, and Posthumanism is in fact open to the consideration of the needs of nonhumans.

Rhetorical Synthesis Practice Questions

Exercise 1

Select the best choice out of the four options.

1. While researching a topic, a student has taken the following notes:
 - Personal trainers are fitness experts who help clients implement their health and exercise goals.
 - Trainers often personally guide their clients with customized workouts.
 - They can help clients with their greatest areas of need, like endurance, strength, or flexibility.

- Trainers ensure that clients train safely, helping them maintain the proper exercise form.
- Some trainers choose to pursue a four-year degree in exercise science or a related field, while others complete a one-year certificate program.
- In addition to a formal education, trainers are almost always expected to have CPR training.

The student wants to present a how personal trainers can prevent clients from becoming injured. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) Personal trainers often pursue educational credentials, like an exercise science degree, that gives their clients confidence in their skills.
- (B) For clients who need help with building their strength and endurance, a personal trainer is an excellent option.
- (C) Personal trainers can customize workouts for clients, improving their chances of achieving their fitness goals.
- (D) Through monitoring the proper exercise form of their clients, personal trainers help clients train safely.

2. While researching a topic, a student has taken the following notes:

- More than 70 percent of the Earth's surface is covered with water.
- Water makes up most of the human body.
- Water is a rather simple compound: 2 hydrogen atoms covalently bonded to 1 oxygen atom.
- Water has several unique chemical properties that make it rather suitable for life.
- Water is considered a universal solvent, enabling cells to use nutrients and oxygen.

The student wants to emphasize the widespread prevalence of water. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) Covering over 70 percent of the Earth's surface, water is widely found on our planet.
- (B) Since it is a universal solvent, water is quite useful in biological processes.
- (C) The simplicity of the composition of water belies the complexity of the organisms in which it is found.
- (D) Many chemical compounds, including water, make up the human body.

3. While researching a topic, a student has taken the following notes:

- During the late 1800s, the private boxes at the Academy of Music Opera House were reserved for the most elite families in New York City.
- After being excluded from the Academy of Music private boxes, some newly wealthy families met to create a new opera house.
- The new opera house would be more extravagant than the Academy of Music one, giving the families an opportunity to display their great wealth.
- The newly formed opera house was called the Metropolitan Opera house, known today as the "Met."
- Just three years after the formation of the Met, the Academy of Music shut down as people flocked to the new performing center.
- Today, the Met continues to perform at Lincoln Center in New York City

The student wants to present a likely emotional cause for the formation of the Met. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) Feelings of exclusion from the elite society of the Academy of Music likely motivated wealthy families to create an alternative organization.
- (B) A pure love of musical artistry by wealthy families most likely propelled them to initially create the Academy of Music.
- (C) It is remarkable that the Met has endured over the span of three different centuries.
- (D) After the closure of the Academy of Music, wealthy families who earnestly missed operatic performances created the Met.

4. While researching a topic, a student has taken the following notes:

- *Claire of the Sea Light* is a novel by Edwidge Danticat.
- In the work, the woes of Haiti are addressed directly and indirectly.
- The narrative threads through the lives of a town where everybody knows everybody and no one tragedy can exist on its own.
- The novel emphasizes several themes:
 - displacement and exile
 - disrupted familial relationships,
 - the inheritance of trauma and loss
 - the fluidity of personal identity and belonging
- The novel's attention to current sociopolitical issues offers a more multifaceted and activist-oriented personal account than some of Danticat's other novels.

The student wants to summarize how Danticat treats the concept of personal identity in *Claire of the Sea Light*. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) Danticat articulates how family is at the core of what gives people their authentic identity.
- (B) Danticat shows that tragedy can affect not just one person but everyone in a town.
- (C) Danticat observes how activists tend to experience a reduction in social exile.
- (D) Danticat emphasizes how personal identity can be ever-changing instead of constant.

5. While researching a topic, a student has taken the following notes:

- An adjuvant is a substance that enhances the body's immune response to an antigen.
- Adjuvants are used in the field of medicine.
- They are used as a possible solution to antibiotic resistant bacteria in patients.

- Gaston Ramon, a French veterinarian, discovered adjuvants while observing and treating diseases in horses.
- Adjuvants are coupled with antibiotics to re-sensitize bacteria to antibiotics, making the antibiotics effective again.
- *E. coli* without the transcription factor, EF-P, are more sensitive to antibiotics than *E. coli* with it.

The student wants to emphasize how modern doctors might use adjuvants to improve patient outcomes. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) Doctors might use adjuvants to help patients who are infected with antibiotic-resistant bacteria.
- (B) Adjuvants can be especially useful in helping those in emergency room settings.
- (C) An adjuvant is the most helpful treatment for patients with an *E. coli* infection.
- (D) Veterinarians discovered the extremely useful technology of adjuvants; now the technology is used on human patients.

Answer Explanations

1. **(D)** The question asks us to present how personal trainers can prevent client injury. Choice (D) accomplishes this task by stating that through making sure clients use the proper exercise form, the clients will avoid injury. Choice (A) focuses on education instead of injury prevention. Choice (B) focuses on strength and endurance, which is not nearly as directly related to safe training as choice (D). Choice (C) vaguely mentions client workout customization.
2. **(A)** “Prevalence” means commonality—choice (A) shows just how widespread and common water is on our planet. It is not choice (B) because this is much more indirect in suggesting the prevalence of water. It is not choice (C) because this focuses on complexity instead of commonality. It is not choice (D) because this limits the discussion to the human body instead of discussing how widespread water is.

3. **(A)** The notes state that “after being excluded from the Academy of Music private boxes, some newly wealthy families met to create a new opera house.” Based on this, the likely emotional cause for the formation of the Met was a feeling of exclusion, as noted in choice (A). It is not choice (B) because there is no evidence that a pure love of music was the primary motivation. It is not choice (C) because this has nothing to do with an emotional cause. It is not choice (D) because the Met was created before the end of the Academy of Music, helping to bring about its demise.
4. **(D)** The question asks us to summarize how Danticat treats the concept of personal identity in the novel. Choice (D) effectively accomplishes this task by paraphrasing the note that a theme of the novel is “the fluidity of personal identity and belonging.” Choice (A) is incorrect because Danticat highlights “disrupted familial relationships,” not how family is the key to personal identity. Choices (B) and (C) do not relate to personal identity.
5. **(A)** The notes state that adjuvants are used “as a possible solution to antibiotic resistant bacteria in patients.” Therefore, if a student wants to show how the adjuvants can be used to improve patient outcomes, emphasizing how they reduce infection in antibiotic resistant bacteria makes sense. Choice (B) is not supported by the notes. While *E. coli* are mentioned in the final bullet, the point is not on whether adjuvants are particularly helpful but on the type of *E. coli* that is more sensitive to antibiotics—this makes choice (C) incorrect. Choice (D) does not elaborate on the relative effectiveness of adjuvants.

Exercise 2

Select the best choice out of the four options.

1. While researching a topic, a student has taken the following notes:
- In single-celled organisms, mitosis is used for reproduction.
 - Mitosis also occurs in more complex organisms for tissue growth and replacement of cells.

- In mitosis, the nucleus splits to form two sets of identical chromosomes resulting in two daughter cells with the same genetic material.
- Meiosis is cell division particular to organisms that use sexual reproduction.
- Meiosis splits the number of chromosomes in parent cells in half so that they can combine in offspring.
- Meiosis is essential for genetic diversity.

The student wants to emphasize a significant similarity between mitosis and meiosis. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) Mitosis and meiosis are both used by living things for reproduction.
- (B) Mitosis maintains the same genetic material, while meiosis leads to greater diversity.
- (C) Mitosis and meiosis are used equally by organisms throughout the Earth.
- (D) Mitosis and mitosis both allow for exact copies of an organism to be replicated generation after generation.

2. In preparing for a physics experiment on simple harmonic motion (SHM), a student has taken the following notes:

- SHM is periodic motion where the restoring force is proportional to the displacement of the object in motion.
- Examples of SHM are the simple pendulum and an object on a spring.
- Periodic motion involves the oscillation of an object about an equilibrium or lowest potential energy position.
- Formulas for SHM assume relatively small oscillations.
- The experiment will evaluate the impact of changing the mass of the attached object and the length of the string on the length of the oscillations

The student wants to emphasize the type of intervals at which an object in simple harmonic motion will most likely oscillate. Which

choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) When moving in a simple harmonic, an object will likely have oscillations at irregular intervals.
- (B) Objects in simple harmonic motion often utilize an object on a spring.
- (C) Experiments are needed to determine more about the mass of attached objects in a simple harmonic motion.
- (D) Objects in simple harmonic motion most likely move in a regular pattern.

3. While researching a topic, a student has taken the following notes:

- The bullroarer is an instrument made of a wooden slat typically measuring between 6 and 24 inches long, affixed at one end to a length of twisted cord.
- The bullroarer is widespread among ancient cultures, and is also known as a “tundun,” or “whizzing-stick.”
- The oldest known bullroarers were discovered in the Ukraine, and are estimated to date from the Paleolithic era, approximately 17,000 B.C.E.
- The sound of the bullroarer is rather unique and has been likened both to an animal’s roar and the approach of a distant thunderstorm.
- Pitch modulation can be achieved by altering the speed of rotation, or the length of the cord.

The student wants to emphasize the long duration of the bullroarer in human history. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) With a sound like a thunderstorm or animal roar, it is no wonder that the bullroarer has been popular for quite a while.
- (B) While Ukraine is the location of a bullroarer discovery, other locations around the world can make a similar claim to fame.
- (C) Having been by humans since at least the Paleolithic era, the bullroarer has been a part of human music for at least 17

millennia.

- (D) More ancient than any other instrument in human history, the bullroarer is a foundational component of many civilizations.

4. While researching a topic, a student has taken the following notes:

- Feminism endeavors to create equality and empowerment for all persons.
- Feminist theory is therefore used to analyze the reasons behind social inequality.
- Beth Richie is an African American feminist and professor.
- Her book *Arrested Justice: Black Women, Violence, and America's Prison Nation* is an important work in the field of feminist theory.
- Richie's goal is to expose the ways black women have been left in particularly vulnerable and dangerous positions.
- Richie's research concludes that Black feminist theory provides an effective and forceful counter-narrative that can help dismantle the inequality of incarceration.

The student wants to emphasize the connections between Richie's goal and the general idea of feminist theory. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) *Arrested Justice: Black Women, Violence, and America's Prison Nation* is a work by the noted feminist Beth Richie.
- (B) Richie epitomizes the feminist quest to understand social inequality by endeavoring to understand why black women have been left in vulnerable positions.
- (C) Feminism examines why social inequality exists so that there can be a more equitable society.
- (D) The inequality of incarceration is something that many contemporary authors have examined.

5. While researching a topic, a student has taken the following notes:

- A spectrometer is an instrument that spreads a wave of electromagnetic radiation into its component frequencies.

- If you look at a simple beam of white light through a spectrometer, you will see a continuous band of colors shifting like a rainbow from red to violet.
- When a material is heated, you can look at the flames given off through a spectrometer to determine what chemicals make up the material.
- This is possible because the band of light is broken into a series of lines that represent specific frequencies of electromagnetic radiation that are emitted from the compound.
- Astronomers can attach a spectrometer to a telescope to determine the chemical composition of stars.

A student wants to present what makes the spectrometer useful to astronomical research. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) While a spectrometer can spread a wave of electromagnetic radiation into the frequencies that compose it, astronomers are more likely to find its capacity to create a beam of white light more useful.
- (B) Since a spectrometer can use light from a heated object to determine the object's chemical composition, astronomers can use it to determine the chemical makeup of stars.
- (C) Astronomers can use a spectrometer to determine the distance that certain astronomical bodies, like stars, are from Earth.
- (D) When astronauts take a spectrometer with them into space, they can put chemicals from meteorites into the spectrometer to determine the meteorites' chemical composition.

Answer Explanations

1. (A) The student wants to emphasize a major similarity between mitosis and meiosis. According to the notes, mitosis is used by single-celled organisms for reproduction, and meiosis is used by organisms that use sexual reproduction. Therefore, both processes are used by living things for reproduction. It is not choice (B) because this shows a difference between the two. It is not choice (C) because there is no

evidence presented in the notes that both processes are used equally throughout the Earth. It is not choice (D) because meiosis does not create exact copies of organisms, but instead blends parts of their genetic compositions in creating offspring.

2. **(D)** The student wants to emphasize the type of intervals at which the SHC motion will likely oscillate. Choice (D) is the only option that uses the notes to describe the intervals of oscillation—they are regular since the notes describe the motion is “periodic.” It is not choice A because the oscillations will be regular, not irregular. It is not choice (B) or (C) because these do not describe the oscillation intervals.
3. **(C)** Choice (C) emphasizes the long duration of the bullroarer in human history by showing that the bullroarer has been around for millennia, since the Paleolithic era. It is not choice (A) because this focuses on the sound of the instrument instead of its duration. It is not choice (B) because this does not discuss time. It is not choice (D) because it is too vague—we have no clear sense from this just how ancient the bullroarer is.
4. **(B)** According to the notes, “Richie’s goal is to expose the ways black women have been left in particularly vulnerable and dangerous positions.” Moreover, according to the notes, feminist theory is generally “used to analyze the reasons behind social inequality.” Choice (B) connects these two ideas. choice (A) just states a fact about Richie’s authorship. Choices (C) and (D) do not directly connect to Richie.
5. **(B)** The spectrometer is useful to astronomers because it can attach it to a telescope to determine the chemical composition of stars—choice (B) makes this capacity clear. Choice (A) is not supported by the notes since the spectrometer is used to analyze beams of light, not create them. It is not choice (C) because the spectrometer is not used to determine distance. It is not choice (D) because chemicals are not inserted into the spectrometer; instead, the light emitted from the objects is analyzed.

Additional Practice Exercises

The problems in these exercises represent the variety of SAT Writing questions you could encounter. Take about ten minutes for each exercise.

Exercise 1

1. The European cuckoo mother bird does not randomly deposit her egg; she chooses the nests of specific species with eggs that resemble _____ the European cuckoo. She deposits her egg and leaves it with the other bird's eggs, and that is the extent of her parenting.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) those of
- (B) these of
- (C) this from
- (D) this of

2. On certain occasions, he is brutally ashamed of his _____ overcompensates for his treachery by defending his father at all costs.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) father's deceit, on others he
- (B) fathers deceit: on others he
- (C) father's deceit; on others, he
- (D) fathers' deceit—on others, he

3. With music that is highly repetitive, Glass has been referred to as a minimalist and aligned with the work of other composers like La Monte Young, Terry Riley, and Steve Reich.

_____ marked by a nonnarrative and nonrepresentational conception of a work in progress, and represents a

new approach to the activity of listening to music by focusing on the internal processes of the music.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) Minimalism a term that Glass has taken strides to distance himself from, is
- (B) Minimalism: a term that Glass has taken strides to distance himself from is
- (C) Minimalism—a term from which Glass has taken strides to distance himself—is
- (D) Minimalism, a term from which Glass has taken strides to distance himself—is

4. When searching for jobs, your online profile should be very thorough. Make sure to post a _____ allows the employer to see that you are a real person with real skills and makes you more likely to be interviewed.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) professional picture, this
- (B) professional picture: this
- (C) professional; picture this
- (D) professional picture this

5. Do ever you remember hearing in school that the sun—by far the largest body in our solar system—is composed almost entirely of the two smallest elements, _____

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) hydrogen, and helium.

- (B) hydrogen and helium.
- (C) hydrogen, and helium?
- (D) hydrogen and helium?

6. If you choose to teach at the secondary level, it is best to be ready to answer questions about college, career planning, and young adult issues. One thing is _____ a good teacher is there because they want to be.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) for sure,
- (B) for sure: a good
- (C) for sure a good
- (D) for a

7. Detractors argue that the lack of scientific oversight during underwater construction is bound to result in failure. _____ many anticipate the wealth of knowledge and new discoveries that will certainly follow underwater monitoring.

Which choice completes the text with the most logical transition?

- (A) And,
- (B) Consequently,
- (C) Still,
- (D) Therefore,

8. While researching a topic, a student has taken the following notes:

- Pierre-Auguste Renoir was a lead painter in the impressionist movement.
- He was born in Limoges, Haute-Vienne, France in 1841.
- The artists Camille Pissarro and Edouard Manet inspired his style and painting techniques.
- His most popular paintings consist of: *Dance at Le Moulin de la Galette*, *Luncheon of the Boating Party*, and *The Swing*.

- Renoir’s paintings are known for their vibrant light and saturated color.

The student wants to emphasize what makes Renoir’s paintings distinctive. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) Renoir was uniquely influenced by the impressionist artists Pissarro and Manet.
- (B) *Dance at Le Moulin de la Galette* is one of Renoir’s most famous works.
- (C) The famous impressionist artist Pierre-Auguste Renoir was born in France in 1841.
- (D) Renoir’s impressionist paintings are known for having saturated color and vibrant light.

Answer Explanations

1. (A) “Those of” correctly represents a logical comparison between the nests of the cuckoo and the plural nests of other birds. Choices (C) and (D) are both singular, and choice (B) incorrectly uses “these,” which is improper wording in a comparative situation.
2. (C) The semicolon in this choice separates the two independent clauses. The apostrophe before the “s” after “father” indicates singular ownership. The comma after “others” gives a necessary break after the introductory phrase. Choice (A) creates a run-on. Choice (B) does not show possession. Choice (D) shows possession of plural fathers.
3. (C) The dashes set aside the parenthetical phrase, and the word choice in choice (C) is logical. Choices (A) and (B) do not set aside the parenthetical phrase. Choice (D) uses inconsistent punctuation to set aside the phrase.
4. (B) The colon serves to give a needed pause between the independent clause before the colon and the clarifying independent clause after the

colon. Choices (A) and (D) each produce a run-on sentence. Choice (C) interrupts “professional picture.”

5. **(D)** The sentence asks a question, so a question mark is needed, making choices (A) and (B) incorrect. Since just two items are listed, there is no need for a comma to separate them, making choice (C) incorrect and (D) correct.
6. **(B)** The colon is appropriate because it indicates a clarification to follow. Choice (A) results in a comma splice, while choices (C) and (D) result in run-on sentences.
7. **(C)** This is the only option that provides a needed contrast between the argument in the first sentence that the process will result in failure and the current sentence in which there is the potential for a wealth of knowledge and discoveries. The other options do not convey a contrast.
8. **(D)** The notes state that “Renoir’s paintings are known for their vibrant light and saturated color.” This shows what makes his paintings unique or distinctive. It is not choice (A) or (C) because these do not focus on Renoir’s paintings. It is not choice (B) because this does not analyze why this painting is famous.

Exercise 2

1. There are more ways than ever to market yourself and your skills, and to network with other professionals in your field. You will want to make sure you are competing in the online job hunt. Career websites like LinkedIn and Monster make it simple to get started. Within your online profiles, it is critical that you _____ information about your educational background, previous work experience, internships, research positions, and volunteer efforts. Now is not the time to be modest.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) included
- (B) include
- (C) including
- (D) to include

2. Newton's equation explained why that apple fell onto his head, _____ and how Earth orbits the sun. It also allowed NASA scientists to send a man to the moon many years later.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) why on the ground one firmly stays,
- (B) on the ground one firmly stays,
- (C) why one stays firmly on the ground,
- (D) one stays firmly on the ground,

3. In his book *The Secret Life*, Dali inquires as to why in a restaurant when he requested a grilled lobster, he was never _____ a boiled telephone.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) brung
- (B) brought
- (C) bring
- (D) brang

4. A spectrometer is an instrument that spreads a wave of electromagnetic radiation into its component frequencies. When you look through a spectrometer at a beam of white light, _____ a continuous band of colors shifting like a rainbow from red to violet.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) and you see
- (B) and one can see
- (C) and he or she can find
- (D) you see

5. By creating a metric theory of gravitation, Einstein showed that phenomena in classical mechanics correspond to inertial motion within a curved geometry of space-time. This scientific discovery laid the groundwork in both astrophysics and cosmology for years to come. Not only did the theory help to explain an irregularity in Mercury's orbit, but _____ and set the theoretical foundations for black holes.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) the bending of starlight was also demonstrated by it
 - (B) starlight used it to bend the demonstration
 - (C) it also demonstrated how starlight bends
 - (D) demonstrating the starlight
6. A popular theory posits that Neanderthals met their extinction through absorption. That is—supposing Neanderthals were not a distinct species, _____ rather a subspecies of *Homo sapiens*—some researchers believe that they disappeared after interbreeding with humans when they arrived in Eurasia roughly 80,000 years ago.

Which choice completes the text with the most logical transition?

- (A) but
 - (B) and
 - (C) or
 - (D) to
7. For those interested in pursuing a career as an environmental engineer, a bachelor's degree is a must. _____ a degree in environmental

engineering is necessary, related fields such as general or civil engineering can be acceptable as well.

Which choice completes the text with the most logical transition?

- (A) If
- (B) When
- (C) While
- (D) So

8. While researching a topic, a student has taken the following notes:

- Biltmore Estate sits on 8,000 acres of land in Asheville, North Carolina.
- It took around six years to complete, starting in 1889 and opening for his family on Christmas Eve in 1895.
- The mansion has an indoor swimming pool, bowling alley, conservatory, and library.
- George Washington Vanderbilt II built the estate after falling in love with the scenery and climate of the area.
- The Biltmore Estate is the largest privately owned house in the United States.

The student wants to summarize some of the unique architectural features of Biltmore. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) The land on which Biltmore sits is approximately 8,000 acres.
- (B) Builders took approximately six years to complete Biltmore.
- (C) Biltmore boasts both a conservatory and a bowling alley.
- (D) The climate and scenery of the Asheville area made for a uniquely beautiful setting for a large home.

Answer Explanations

1. **(B)** The text is in the present tense, and “include” is the only option that maintains this consistent tense. Moreover, “you include” demonstrates the proper conjugation of the verb.

2. **(C)** This is the only choice that is parallel to the other items listed in this sentence. Not only are the other options not parallel, they also have confused word orders.
3. **(B)** “Brought” is the correctly used tense of “to bring” in this context.
4. **(D)** “Specific” in this case means “unique,” stating that the chemical signature given off by each element is unique to it. Choice (A) is too wordy. Choice (B) is incorrect because “partial to” means “to prefer” something. Choice (C) uses an adverb instead of an adjective.
5. **(C)** This choice is correct because the construction of the second part of the sentence is parallel to the first part of the sentence; additionally, it puts the words in a logical order. Choice (A) uses passive voice. Choice (B) confuses the intended meaning. Choice (D) is not parallel.
6. **(A)** “But” will logically complete the phrase “not” this, “but rather” that. The other options would not complete this phrase appropriately.
7. **(C)** The sentence conveys a contrast between what is necessary and what is acceptable. “While” is the only option that provides a contrast.
8. **(C)** The notes state that “the mansion has an indoor swimming pool, bowling alley, conservatory, and library.” Since these features are architectural, citing some of them makes sense if the student wants to summarize some of the unique architectural features found at Biltmore. The other options focus on nonarchitectural features, like the land area of the property, how long it took to build, and the setting of the home.

Advanced Practice

The following questions are designed to represent the most challenging sorts of questions you could encounter on the SAT Writing. Take about ten minutes for each exercise.

Exercise 1

1. It wasn't until 1915 that Albert Einstein expanded on Newton's work to impart his theory of general relativity, which states that the gravity of any mass curves the space and time around it. Einstein's theory of relativity is superior to _____ because it considers special relativity and can be used when great precision is necessary.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) Newton
 - (B) it
 - (C) these
 - (D) Newton's law of universal gravitation
2. While using Bernice and Marjorie to model both eras, Fitzgerald finds flaws in _____ the new approach is only relaxed on the surface.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) both: the old manner is a lifeless forgery, while
 - (B) both, the old manner is a lifeless forgery while
 - (C) both—the old manner is a lifeless, forgery, while
 - (D) both; the old manner, is a lifeless forgery while
3. In these settings, occupational therapists work with clients to help them better participate _____ the areas of occupation.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) in all the any of
- (B) in any all of
- (C) in any or all of

(D) in all of and any of

4. One possible justification for involving humans in the actual exploration is that _____ increase interest in funding space exploration projects.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) they do
- (B) it does
- (C) one do
- (D) OMIT the underlined portion

5. It can be described as one of the greatest mysteries of modern physics. In a universe that _____ neutrality, the apparently asymmetrical distribution of the baryon charge is a singular and tantalizing puzzle.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) tends universally, as it were toward net
- (B) tends—universally, as it were toward net
- (C) tends—universally as it were, toward net
- (D) tends—universally, as it were—toward net

6. Panes created using the glass spinning technique are usually identifiable for their bulbous centers and wavy surface _____ the edges joining with the window frame are typically narrower than the pane's body.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) texture, additionally they are often very fragile, as

- (B) texture; additionally, they are often very fragile, as
- (C) texture. Additionally they are often very fragile as
- (D) texture additionally, they are often very fragile, as

7. Recent studies of Neanderthal anatomy and artifacts suggest that they were remarkably well-equipped to deal with the fiercely cold and barren conditions, _____ even thrived within them for nearly 200,000 years.

Which choice completes the text with the most logical transition?

- (A) and
- (B) but
- (C) for it was the case that they
- (D) OMIT the underlined portion.

8. While researching a topic, a student has taken the following notes:

- In *The Republic*, Plato attempts to create a blueprint for a just city-state in which its constituents prescribe to reason and live in communal harmony.
- In his construction of an ideal city-state, Plato reevaluates the kinship (family) relations that comprise society.
- Plato sought to replace the kinship system with a new model in which people who aren't blood relatives still interact in ways now reserved for familial relations.
- Plato argued that the city-state forms a communal family: "every time he meets any of them, he will assume he is meeting his brother, or sister, or mother, or son, or daughter—or the child or parent of one of these."
- Plato claims that his new model would eliminate the familial loyalty that supersedes state loyalty.

The student wants to present a generalization about how Plato thought about the family and the state. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) Those who have blood relationships to one another should be excluded from being in the same governmental state.

- (B) Loyalty to the members of one's family should rightly take precedence over loyalty to one's government.
- (C) Plato argued that the connections between members of a state should outweigh the connections from familial relations.
- (D) Kinship is at the core of what will create a monarchical system, with the monarchy passed from one generation to the next.

Answer Explanations

1. **(D)** This is the only option that gives a logical comparison between the theory of Einstein and the theory of Newton. Be sure to compare the same sorts of objects to one another.
2. **(A)** In choice (A), the colon comes after a complete sentence right before the flaws are clarified and the comma comes before the transitional "while." Choice (B) results in a run-on sentence. Choice (C) has an unnecessary comma after "lifeless." Choice (D) has an unnecessary comma after "manner."
3. **(C)** This works because the occupational therapist could potentially help with "any" of the areas or "all" of the areas. Choices (A) and (B) do not use prepositions correctly, and choice (D) uses "and," which would not make sense because both "all of" and "any of."
4. **(B)** The "it" refers to the act of involving humans in exploration, which would be singular. "Does" is the correct form of the verb "to do" when coupled with a singular subject. Choice (D) could potentially work if instead of "that" it said "the" immediately before the underlined phrase, and if instead of "increase" it said "increased" immediately following the underlined phrase.
5. **(D)** This is the only option that sets off the parenthetical phrase with the same sort of punctuation on either side, i.e., a dash. Commas can also set up parenthetical phrases, but there must be a comma before and after the phrase.

6. **(B)** The semicolon provides a needed break between the two independent clauses, and the comma after “additionally” gives an appropriate pause separating the transition from the complete sentence that follows. Choice (A) is a run-on sentence, choice (C) lacks a needed comma after the introductory word “Additionally,” and choice (D) is also a run-on.
7. **(A)** The last part of this sentence gives more support to the claim in the first part of the sentence, making “and” appropriate. Choice (B) shows contrast, choice (C) is too wordy, and choice (D) removes a needed transition.
8. **(C)** The notes state that “Plato sought to replace the kinship system with a new model in which people who aren’t blood relatives still interact in ways now reserved for familial relations.” In other words, Plato believed that the connections between citizens of a country should be more important than the connections between family members—this aligns with choice (C). It is not choice (A) because there is no evidence to suggest that Plato believed that people of the same family could not be in the same country. It is not choice (B) because this gets Plato’s argument backwards. It is not choice (D) because the notes do not focus on the possibility of a monarchy.

Exercise 2

1. Piketty’s data on the wealthy elite makes it somewhat pioneering despite its foundations in age-old economics.
_____ redistribution through a progressive global tax on wealth.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) Piketty even offers a solution; economic
(B) Piketty, even offers a solution, economic
(C) Piketty even offers a solution: economic

(D) Piketty even offers, a solution economic

2. As glass enters the bath, its specific gravity and immiscibility with tin _____ a continuous ribbon with perfectly smooth surfaces on both sides and an even width throughout.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) causes it to form
 - (B) causes them to form
 - (C) cause them to form
 - (D) cause it to form
3. While Pluto is in orbit around the sun and has become nearly round, it isn't big _____. In other words, Pluto is not gravitationally dominant in its area and shares its space with astronomical bodies of a relatively large size.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) enough, and therefore doesn't have enough gravity, to clear its orbit.
 - (B) enough and therefore, doesn't have enough gravity, to clear its orbit.
 - (C) enough and therefore doesn't have enough gravity to clear, its orbit.
 - (D) enough, and, therefore, doesn't have enough gravity, to clear its orbit.
4. The Parthenon Temple itself was completed in 438 B.C., although decorative sculpting and engraving within the structure went on for several more years. Since then, the structure has served as _____.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) temple, treasury, church, and most recently, tourist attraction.
- (B) temple, treasury church, and most recently, tourist attraction.
- (C) temple treasury, church and most recently tourist attraction.
- (D) temple treasury church, and most recently tourist attraction.

5. Strindberg and Ibsen—writing in the same genre at the same point in history and emerging from both the same level of society and corner of the world—_____ developed remarkably antithetical worldviews, each powerful enough not only to weather the criticism of the opposition but to develop and grow despite it.

Which choice completes the text with the most logical transition?

- (A) nonetheless
 - (B) consequently
 - (C) also
 - (D) divergently
6. The exchange is notable in that it is the first time Griselda directly asserts her desires to Walter, and although she desists as soon as he raises an objection, she allows herself, finally, at _____ she feels to be right and honorable.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) what she believes, to be the end of their marriage, to communicate to him what
- (B) what she believes to be the end of their marriage to communicate to him what
- (C) what she believes—to be the end of their marriage, to communicate to him what

(D) what she believes to be the end of their marriage, to communicate to him what

7. Rognlie argues that, according to the law of diminishing returns, the rate of return will eventually _____ on to say that Piketty has an inflated idea of current return and doesn't consider depreciation.

Which choice completes the text so that it conforms to the conventions of Standard English?

- (A) decrease; goes
- (B) decrease, goes
- (C) decrease; he goes
- (D) decrease, he goes

8. While researching a topic, a student has taken the following notes:

- Cosmic expansion is the idea that an expanding universe could be traced back to a single point.
- The scientist Georges Lemaître hypothesized the idea of cosmic expansion in 1927.
- In 1929, scientist Edwin Hubble confirmed Lemaître's work when he discovered that galaxies were drifting apart.
- For many scientists, Hubble's observations gave convincing evidence of the big bang theory.
- The big bang theory states that after cosmic expansion, the universe cooled to form subatomic particles.
- The theory also states that these subatomic particles that created atoms and the elements.
- These elements went on to form stars and galaxies.

The student wants to highlight the connection between the work of Lemaître and Hubble. Which choice most effectively uses relevant information from the notes to accomplish this goal?

- (A) Hubble provided experimental observations to support Lemaître's hypothesis.

- (B) Lemaître used the observations that Hubble made about the big bang to formulate a comprehensive scientific theory.
- (C) Modern scientists greatly appreciate the detailed observations that both Lemaître and Hubble made in the 1920s.
- (D) Lemaître's theory about subatomic particles was confirmed by Hubble's theory about the big bang.

Answer Explanations

1. **(C)** This option correctly uses a colon to set off a clarification. Choice (B) uses a comma, which does not provide a sufficiently significant pause. Choice (D) has a pause in an awkward spot. Choice (A) needs a complete sentence after the semicolon.
2. **(D)** The compound subject of "specific gravity and immiscibility with tin" demands a plural verb; hence, "cause" works. Also, "it" is correct since the pronoun refers to the singular "glass."
3. **(A)** The parenthetical element here was tricky to diagnose. Nonetheless, "and therefore doesn't have enough gravity" was the parenthetical element; remove it from the sentence and the clause still functions perfectly well. As a rule, a parenthetical element can be surrounded by two dashes or two commas to separate it from the rest of the sentence. Choice (B) uses the two commas but splits the parenthetical element into pieces. Choice (C) omits the first comma. Choice (D) has entirely too many commas within the parenthetical element, preventing continuity. Choice (A) is the best option.
4. **(A)** This choice gives necessary breaks between all the listed items and has a break after the clarifying phrase "most recently." Choices (B), (C), and (D) all change the original meaning because of their comma placements or lack thereof.
5. **(A)** "Nonetheless" means "in spite of," which makes sense given the fact that these writers had similar backgrounds yet ended up having very different worldviews. "Consequently" in choice (B) indicates

cause and effect. “Also” in choice (C) indicates the continuation of thought. “Divergently” in choice (D) could apply toward the differences in their views but does not work as a transition to show a logical contrast.

6. **(D)** The entire phrase “at what she believes to be the end of their marriage” is parenthetical. Choice (D) is the only option that both leaves this phrase intact and places a comma at the end of it so that it is set aside from the rest of the sentence.
7. **(C)** This option both clarifies the subject and uses a semicolon to give a clear break between the independent clauses. Choice (A) does not have the necessary independent clause after the semicolon. Choice (B) does not give a parallel construction. Choice (D) creates a comma splice.
8. **(A)** The notes state that Lemaître hypothesized the idea of cosmic expansion, while Hubble made observations that confirmed this theory. It is not choice (A) because Lemaître preceded Hubble. It is not choice (C) because this does not explain how Lemaître and Hubble are connected. It is not choice (D) because there is no evidence that Lemaître had a theory about subatomic particles.

PART 5

Math



Math for the Digital SAT

Introduction and Strategies

What Is Tested on the SAT Math? What Math Classes Should I Have Taken?

The SAT Math focuses on the core math skills that you will need to be successful in a variety of college majors and future careers. No matter if you are an engineer, a nurse, a teacher, a graphic designer, or a business manager, it will be important to know how to work with numbers and interpret data. Here is a big picture summary of what is tested:

SAT Math Question Type	Definition	Math Class(es) That Covers It
Algebra	Interpretation of linear equations and solving systems of equations	Mostly covered in Pre-Algebra and Algebra 1
Problem Solving and Data Analysis	Demonstration of literacy with data and graphs with real-world applications	Covered throughout your Pre-Algebra, Algebra 1, and Algebra 2 coursework Science classes can also provide helpful data interpretation skills.
Advanced Math	Working with more complicated equations	Mostly covered in Algebra 2
Geometry and Trigonometry	Working with lines, angles, triangles, circles, and other geometric figures	Mainly in Geometry and Pre-Calculus

How Is the SAT Math Section Structured?

- Two modules, 22 questions each, 35 minutes each
- First module is of a standard difficulty, second module of an adaptive difficulty (will be easier or more difficult depending on student performance on the first module)
- Four of the questions (two per module) are experimental and will not count towards the score.
- Algebra will be about 35% of the questions; Advanced Math will be about 35% of the questions; Problem Solving and Data Analysis will be about 15% of the questions; and Geometry and Trigonometry will be about 15% of the questions.
- The questions generally become more difficult as you proceed through a given module.

What Is *Not* Tested on the SAT Math? What Do I *Not* Need to Worry About?

If you have taken the ACT, you may recall how that test has quite a few more advanced math concepts. Some of the concepts you will NOT need to know for the SAT that are tested on the ACT include:

- Matrices
- Logarithms
- Hyperbolas
- Ellipses
- Cosecant, Secant, Cotangent
- Permutations and Combinations

How Does the SAT Math Differ from Typical Math Tests I Have Taken in School?

Often, students have difficulty with the SAT Math because they approach it the same way as they would typical school math tests and quizzes. This is especially true for high-achieving students who consistently earn A's in their math classes—after all, if their approach works well on one math test, why wouldn't it work well on another math test like the SAT? By realizing

that the SAT Math is quite a bit different from typical school math tests, students are empowered to have a different mindset to help them be successful.

	Typical School Math Tests/Quizzes	SAT Math
Time Management	- Typically, you don't have to worry much about time management. - Tests often do not take the entire class period, or you may be allowed to stay after class to finish up.	- You will likely need the full amount of time to finish. - Move through the test carefully and efficiently to complete every question.
Scoring Curve	- If you miss a couple of questions, your grade may drop quite a bit. - To get an A, you may need to aim for perfection.	- Since the test is heavily curved, do not worry about missing a couple questions. - To get a good score, you do not need to aim for perfection.
Concepts Tested	- Usually highly focused on a particular set of concepts you have recently studied - For example, a test on your factoring unit will focus just on factoring. You have a good sense of what each question will likely be about.	- Tests on a variety of concepts from multiple years of coursework - Cannot go on "autopilot" and just start solving the problem—have to figure out what the question is about
Problem Solving Process	Often, if you do not "know" the formula or problem-solving process from class, you will have trouble coming up with the answer.	- While there is a good bit you need to know, the emphasis on SAT Math problems is to "figure them out" by any means necessary. - Unconventional methods like using estimation, intuition, and plugging in answers are much more applicable.

	Typical School Math Tests/Quizzes	SAT Math
Possible Test Errors	▪ If there is an error on your test or quiz, just let your teacher know and it can easily be fixed.	▪ SAT Math problems go through multiple rounds of review before they are put on an actual test. ▪ Rather than trying to find the flaw in the question, give the question the benefit of the doubt.
Need to Explain Answer	▪ Your teacher may expect you to solve the problem in the way you were taught, clearly writing out every step so you can earn full credit.	▪ You are evaluated simply on whether you answered the question correctly. ▪ Use whatever problem-solving method works best for you.

Can I Use a Calculator?

Yes—The SAT is fairly generous in terms of permitted calculators. Most scientific and graphing calculators are permitted—for a complete, updated list of approved calculators, check here:

<https://collegereadiness.collegeboard.org/sat/taking-the-test/calculator-policy>. Also, there is a calculator embedded within the testing program. You can click to use it whenever you need to do so. The calculator is modeled on the popular Desmos calculator program. On the older paper-based SAT, there was a no-calculator section; on the Digital SAT, you can use a calculator on all the questions in the math modules.

How Do the Fill-in Questions Work?

Approximately 25% of the math questions are fill-ins. Unlike the paper-based SAT in which the fill-in questions were at the end of the section, on the Digital SAT the fill-in questions come at periodic times throughout the test. Here are some important things to know about these problems.

- **It is sometimes possible to have more than one correct answer**—if you fill in any of the correct answers, you will be fine. For example, if the

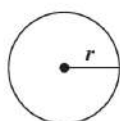
correct answer could be any number between 4 and 6, if you entered 5.5 you would be correct.

- Decimals that continue past the spots allowed for gridding **can be rounded or shortened**, as long as you use all of the spaces on the grid. You can also express the decimal as a fraction. For example, you can write $\frac{7}{9}$ as 7/9, .7777, or .7778 (Note that 0.8, 0.77, or, 0.78 would be considered incorrect.).
- **You don't need to reduce fractions.** For example, since $\frac{2}{3}$, $\frac{4}{6}$, and $\frac{6}{9}$ are equivalent, any of them would work as an answer.
- **Use the Answer Preview tool.** When you enter your answer, use the Answer Preview tool to check that what you intend for your answer is what you actually have down.

The bottom line on fill-ins: The SAT will not *trick* you into missing the problem. If you have a reasonable answer and enter it, you will be in good shape.

Do They Provide Any Formulas?

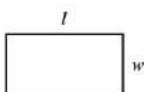
The SAT will provide some of the most important geometry and trigonometry formulas. However, since most of the test covers algebra, you will need to commit algebraic formulas to memory. Here are the formulas you will be given in the testing program as a popup you can open or close as needed.



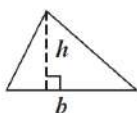
Radius of a circle = r

Area of a circle = πr^2

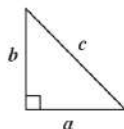
Circumference of a circle = $2\pi r$



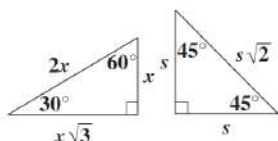
Area of a rectangle = length $\times$ width = lw



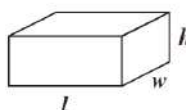
Area of a triangle = $\frac{1}{2} \times \text{base} \times \text{height} = \frac{1}{2}bh$



Pythagorean theorem: $a^2 + b^2 = c^2$

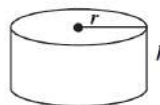


Special right triangles: 30-60-90 and 45-45-90



Volume of a box =

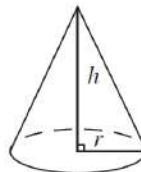
length $\times$ width $\times$ height = lwh



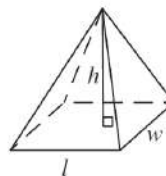
Volume of a cylinder = $\pi r^2 h$



Volume of a sphere = $\frac{4}{3}\pi r^3$



Volume of a cone = $\frac{1}{3}\pi r^2 h$



Volume of a pyramid =

$\frac{1}{3} \times \text{length} \times \text{width} \times \text{height} = \frac{1}{3}lwh$

KEY FACTS:

- A circle has 360 degrees.
- There are 2π radians in a circle.
- There are 180 degrees in a triangle.

How Should I Pace Myself on the SAT Math?

The questions generally increase in difficulty as you progress through them. So, instead of trying to set a stopwatch for each individual question, use these general guidelines:

- **Take between 70–100 seconds per question. If it is an easier/earlier question, go closer to 60–70 seconds; if it is a harder/later question, go closer to 90–100 seconds.** Since the earlier questions are easier, you can spend about 5-6 minutes on the first five questions; since the later questions are more difficult, you can spend about 8-9 minutes on the last five questions.
- **Check your pace at reasonable intervals—every five to six questions is generally a good time to see if you are on pace.** If you check your pace with each problem, you waste time looking at the timer. On the other hand, if you do not check your pace at all, you may be surprised when the timer appears with five minutes remaining. Click on the timer whenever you need to see how much time remains. So long as the timer is not distracting, you could leave it visible throughout the section.
- **Try to do the problems once and well instead of rushing to the end.** With so many word problems on the SAT Math, it is very easy to make a careless mistake by misreading the problem the first time through. Instead of rushing to the end, focus on doing the problems carefully the first time to maximize your score.

If you cannot finish the test in a reasonable amount of time, **guess on the most difficult questions**. These questions will typically come towards the end of the math module.

If you find an earlier question to be overly difficult, go ahead and guess on it—you do not want to spend two to three minutes on a problem and not get anywhere. You can flag the question and come back to it if you have time. Try to be decisive when guessing on a problem; if there are certain problem types that you know are more difficult for you, like long word problems or particular math concepts, guess on those without investing lots of time.

How Can I Use This Book to Prepare for the SAT Math?

- Read the strategies that follow in this section to help you with your test-taking mindset.
- Target your review by studying the math content areas where you have struggled.

- Practice your time management with the SAT problem drills throughout the chapter.
- Take full-length SAT Math tests and review your answers afterwards. Brush up on weak areas through content review.
- Challenge yourself with the advanced math drills at the end of the chapter to simulate the toughest questions you could encounter.

SAT Math Dos and Don'ts

Do fully understand the question, actively checking understanding as you go. Read slowly and carefully, doing the problem one time well.

Don't go on to the next sentence unless you fully understand the previous one. Don't let a desire to finish quickly ultimately make you go more slowly and less accurately.

▸ Example

Four roommates are splitting the rent equally on an apartment. Currently, each roommate's share is \$500 a month. If they were to add one more roommate with whom they would equally split the monthly rent, by how much would the monthly rent for each of the original four roommates decrease?

- (A) \$80
- (B) \$100
- (C) \$120
- (D) \$400

✓ Solution

Fully understand each sentence of the question.

The total rent for an apartment is divided into four equal shares. Each share is currently \$500. This means that the total amount of rent for the apartment is $4 \times 500 = 2,000$.

If one more roommate is added, the total rent must now be divided by 5 instead of 4. So, the new rent per person is $\frac{2,000}{5} = 400$.

Now does this mean the correct answer is choice (D)? No—the question asks us how much each person’s monthly rent would *decrease*. So, subtract the new share from the original share to find the per-person decrease: $500 - 400 = 100$. Therefore, the correct answer is **(B)**.

Do pay attention to the precise question that is asked. Read the entire question, but pay especially close attention to what comes at the end of the text—that is most likely where the question will be found.

Don’t get bogged down in clarifying information. Some of the information in a question may be given so there is no room for misinterpretation—do not dwell on clarifying information like this.

➤ Example

The formula for compound interest is $A = P\left(1 + \frac{r}{n}\right)^{nt}$ where A is the amount accumulated, P is the principal, r is the interest rate, n is the number of times interest is applied in a compounding period, and t is the number of compounding periods. What is the principal in terms of the other variables?

- (A) $P = \frac{1}{A\left(1 + \frac{r}{n}\right)^{nt}}$
- (B) $P = \frac{1}{A\left(1 + \frac{r}{n}\right)^{-nt}}$
- (C) $P = A\left(1 + \frac{r}{n}\right)^{-(nt)}$
- (D) $P = A\left(1 + \frac{r}{n}\right)^{nt}$

✓ Solution

So that there is no room for misinterpretation (e.g., thinking that the constants could represent variables), the SAT clarifies what each constant represents in this question. You can ignore information like this and instead

focus on what the questions asks you to do. The most important parts of the question are underlined below:

The formula for compound interest is $A = P\left(1 + \frac{r}{n}\right)^{nt}$ where A is the amount accumulated, P is the principal, r is the interest rate, n is the number of times interest is applied in a compounding period, and t is the number of compounding periods. What is the principal in terms of the other variables?

So, the problem is much easier to solve than it appears at first glance. All we must do is divide both sides by $\left(1 + \frac{r}{n}\right)^{nt}$ so that the P is by itself, then simplify the expression:

$$A = P\left(1 + \frac{r}{n}\right)^{nt} \rightarrow$$
$$\frac{A}{\left(1 + \frac{r}{n}\right)^{nt}} = \frac{P\left(1 + \frac{r}{n}\right)^{nt}}{\left(1 + \frac{r}{n}\right)^{nt}} \rightarrow$$

Cancel out the like terms to simplify $\rightarrow$

$$\frac{A}{\left(1 + \frac{r}{n}\right)^{nt}} = \frac{P\cancel{\left(1 + \frac{r}{n}\right)^{nt}}}{\cancel{\left(1 + \frac{r}{n}\right)^{nt}}} \rightarrow$$
$$\frac{A}{\left(1 + \frac{r}{n}\right)^{nt}} = P \rightarrow$$

Use a negative exponent to show the part that was in the denominator:

$$A\left(1 + \frac{r}{n}\right)^{-(nt)} = P$$

Do watch out for key words that will change what you are asked to do. In longer word problems and in questions where terms are easily confused, be especially careful.

Don't just assume that because your calculated answer is an option, you must be correct. The SAT will have answer choices based on common misreadings of the questions, so do not jump to conclusions.

Exercise—Spot the difference between the two very similarly worded questions.

- 1A.** A drink stand charges \$2 for a glass of iced tea and \$1.50 for a glass of lemonade. If during an hour of operation, the stand sold a combined total of 14 glasses of tea and lemonade for a total revenue of \$25, how many glasses of lemonade were sold?
- 1B.** A drink stand charges \$2 for a glass of iced tea and \$1.50 for a glass of lemonade. If during an hour of operation, the stand sold a combined total of 14 glasses of tea and lemonade for a total revenue of \$25, how many glasses of iced tea were sold?
- 2A.** If the diameter of a circle is 10 units, what is the numerical difference between the area and circumference of the circle (ignore squared units)?
- 2B.** If the radius of a circle is 10 units, what is the numerical difference between the area and circumference of the circle (ignore squared units)?
- 3A.** Given that $a = 3$ and $b = 4$, what is the product of a and b ?
- 3B.** Given that $a = 3$ and $b = 4$, what is the sum of a and b ?

✓ Solutions

Glasses of lemonade vs. glasses of iced tea

Diameter vs. radius

Product vs. sum

Do write out your work. Writing out your work on the scrap paper will help you avoid careless errors and recognize patterns that you might otherwise miss.

Don't do everything in your head. You will ultimately save time and be more accurate if you write out your work. Common incorrect answers are based on common miscalculations.

➤ Example

Which of the following expressions is equivalent to the polynomial below?

$$(x^2 - 3x) + (2x - 3x^2)$$

- (A) $-2x^2 - x$
- (B) $3x^2 - 2x$
- (C) $-3x^4 + 11x^3 - 6x^2$
- (D) $3x^4 - 11x^3 + 6x^2$

✓ Solution

This problem is not that difficult, yet it is easy to miss if you make an error with negative signs or combining exponents. If you do make a common error, it is highly likely that one of the answer choices will have your incorrect solution. Students who are good at math yet impatient to finish the test are susceptible to this sort of error. So, write out your work step-by-step to get it right:

$$(x^2 - 3x) + (2x - 3x^2) \rightarrow$$

Remove the parentheses since you are not multiplying:

$$x^2 - 3x + 2x - 3x^2 \rightarrow$$

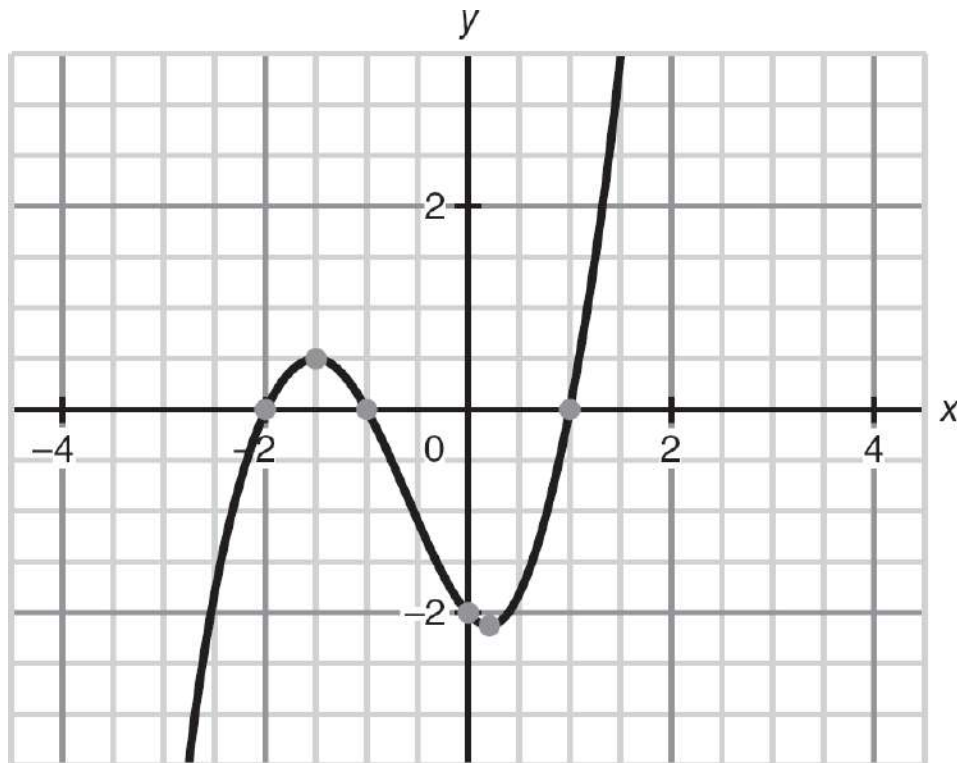
Group like terms together and simplify:

$$\begin{aligned} x^2 - 3x^2 - 3x + 2x &\rightarrow \\ -2x^2 - x &\end{aligned}$$

Do use whatever is given in the problem, like scaled drawings and formulas. All the drawings on the SAT are to scale and problems sometimes have formulas given within them, so take advantage of what you have in front of you.

Don't let yourself be intimidated by longer, more challenging questions. Use whatever knowledge and skills you have to attack the problem.

➤ Example

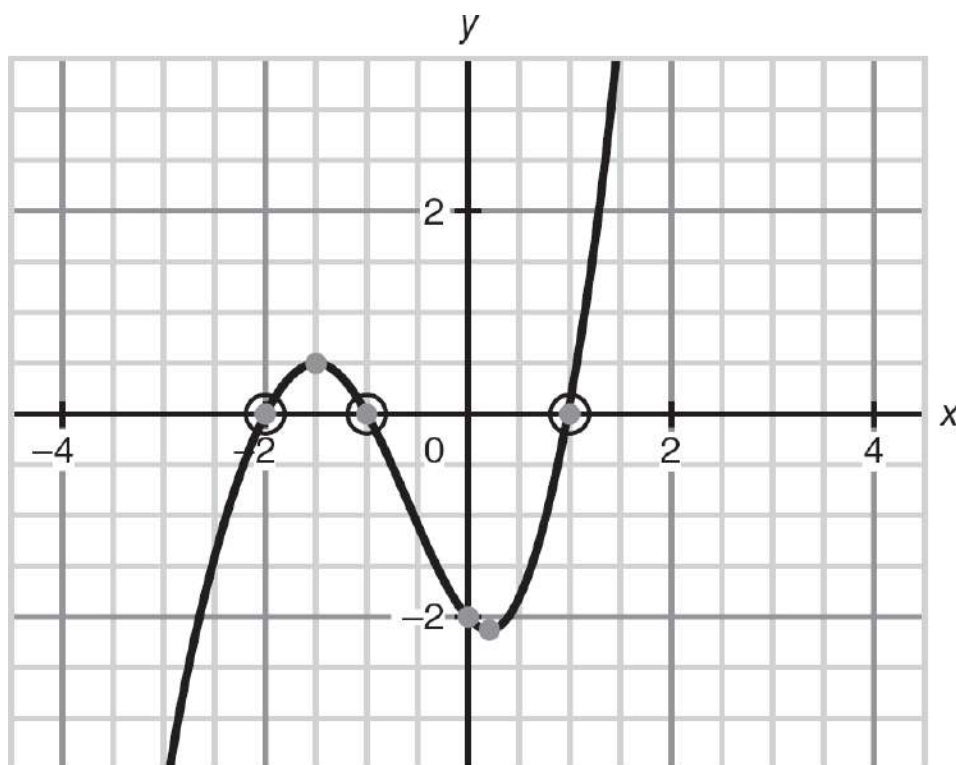


Consider the function $f(x)$ as portrayed in the xy -coordinate plane in the above graph. For how many values does $f(x)$ equal zero?

- (A) 0
- (B) 1
- (C) 2
- (D) 3

✓ Solution

Suppose that you do not remember how to work with complex functions and find zeros. You can still solve this problem without that specific knowledge. The question asks to find how many times the $f(x)$ equals zero—remember that $f(x)$ is the same as the y -coordinate. Examine the points on the graph where the y value is equal to zero:



There are a total of three points where the function is equal to zero because it intersects the x -axis. Therefore, the correct answer is **(D)**. While this problem could also have been solved by creating an equation that had the zeros in it, make things easier for yourself and do not be intimidated.

Do approach the problems like a puzzle that you *figure out*. You may need to write out some work before you see the ultimate steps to solving the problem.

Don't just give up and say you *don't know*. The SAT Math emphasizes the core concepts from early high school math—in all likelihood, you have the background knowledge necessary to solve the problem.

► Example

$$(3x - 5)(3x + 5) + 25 = ax^2$$

In the equation above, what is the value of the constant a ?

Fill-in: _____

✓ Solution

This is not likely a problem you have typically worked with in your math classes. However, you can solve it by using concepts you probably already know—in this case, FOILing and simplifying. You do not need to know any advanced concepts about constants or equation equivalence.

$$(3x - 5)(3x + 5) + 25 = ax^2$$

FOIL the part in parentheses:

$$9x^2 + 15x - 15x - 25 + 25 = ax^2 \rightarrow$$

Add the x terms and the numbers to simplify:

$$9x^2 + \cancel{15x} - \cancel{15x} - \cancel{25} + \cancel{25} = ax^2 \rightarrow$$
$$9x^2 = ax^2$$

Divide both sides to eliminate the $x^2 \rightarrow$

$$\frac{9x^2}{x^2} = \frac{ax^2}{x^2} \rightarrow \frac{9x^{\cancel{2}}}{x^{\cancel{2}}} = \frac{ax^{\cancel{2}}}{x^{\cancel{2}}} \rightarrow 9 = a$$

The correct answer is therefore **9**.

Do use the choices to help see what a solution may look like. Recognize that the answers typically go from least to greatest, so if you need to work your way backwards from the choices, start with answer (B) or (C) and then work your way up or down. Also, use the choices to recognize helpful clues as to your problem-solving process.

Don't jump into the choices too quickly. While plugging in the options does work sometimes, it won't be as frequent as you might like. You will be best served by carefully reading and setting up the problem step-by-step.

➤ Example

For what values of x does $|x - 3| = 5$?

- (A) 8 and 2
- (B) 8 and -2
- (C) -8 and 2
- (D) -8 and -2

✓ Solution

While you could set up two absolute value equations to solve, a glance at the answer choices tells you that plugging in the possible answers will probably save you time. Because each of the numbers 8, -8 , 2, and -2 is in each answer twice, you can eliminate choices more rapidly. First, let's try -8 :

$$|x - 3| = 5 \rightarrow |-8 - 3| = 11 \neq 5$$

Since -8 does NOT work, we can eliminate choices (C) and (D).

Now, try -2 since it is in choice (B) and not in choice (A):

$$|x - 3| = 5 \rightarrow |-2 - 3| = 5$$

This does work, so the correct answer is choice **(B)**. There is no need to also try 8 since both choices (A) and (B) have 8 as a possibility, so trying it out would give us no new information.

Do review and practice in a targeted way. Focus on the problem types and math concepts that are most challenging for you.

Don't practice by simply taking test after test, repeating the same mistakes. Remember that practice doesn't make perfect; "perfect practice" makes perfect. Use this book to focus on areas of weakness so you may turn them into areas of strength.

Here are the major concepts and formulas you will need to know, along with where they are covered in the book:

Algebra—Fundamentals

- Order of Operations ([page 307](#))
- FOIL ([page 308](#))
- Least Common Multiple (LCM) and Greatest Common Factor (GCF) ([page 310](#))
- Solving Fractions ([page 311](#))

Algebra—Solving Equations

- Substitution ([page 313](#))
- Elimination ([page 314](#))
- Pattern Recognition ([page 315](#))
- Plugging in Choices ([page 316](#))
- Inequalities ([page 321](#))
- Absolute Value ([page 322](#))
- Function Notation ([page 323](#))

Algebra—Word Problems and Function Interpretation

- Setting Up Word Problems ([page 335](#))
- Distance, Rate, and Time ([page 337](#))
- Interpreting Variables and Constants ([page 338](#))
- Functions in Table Form ([page 339](#))

Algebra—Lines and Slope

- Slope Formula ([page 352](#))
- Slope-Intercept Form of a Line ([page 353](#))
- Overlapping and Intersecting Lines ([page 354](#))
- Parallel and Perpendicular Lines ([page 355](#))

Advanced Math—Polynomials and Factoring

- Polynomial Manipulation ([page 363](#))
- Common Factoring Patterns ([page 365](#))

Advanced Math—Exponents and Roots

- Exponent Rules ([page 370](#))
- Problems with Exponents and Roots ([page 372](#))

Advanced Math—Solving Quadratic Equations

- Factoring Quadratic Equations ([page 378](#))
- Square Root Method ([page 380](#))
- Quadratic Formula ([page 381](#))
- Completing the Square ([page 383](#))
- Plugging in the Answers ([page 385](#))
- Undefined Functions ([page 387](#))
- Extraneous Solutions ([page 388](#))
- Synthetic Division ([page 390](#))

Advanced Math—Zeros, Parabolas, and Polynomial Graphing

- Zeros of a Function ([page 401](#))
- Parabola Graphing ([page 404](#))
- Function Transformations ([page 409](#))
- Visualizing Polynomial Graphs ([page 412](#))

Advanced Math—Function Interpretation and Manipulation

- Putting Variables in Terms of Other Variables ([page 422](#))
- Identifying Constants ([page 423](#))
- Interpreting Functions ([page 424](#))

Problem Solving and Data Analysis—Measures of Center

- Mean ([page 435](#))
- Median ([page 436](#))
- Mode ([page 437](#))
- Outliers ([page 437](#))
- Range and Standard Deviation ([page 438](#))

Problem Solving and Data Analysis—Unit Conversion

- Conversion with Proportions ([page 445](#))

- Conversion with Unit Cancellation ([page 446](#))

Problem Solving and Data Analysis—Percentages

- Percentage Essentials ([page 451](#))
- Percent Increase and Decrease ([page 454](#))
- Simple Interest ([page 457](#))
- Compound Interest ([page 458](#))

Problem Solving and Data Analysis—Surveys

- Sampling Methods ([page 468](#))
- Drawing Conclusions ([page 469](#))

Problem Solving and Data Analysis—Graphs and Data Interpretation

- Probability ([page 474](#))
- Graph Interpretation ([page 476](#))
- Scatterplots ([page 478](#))
- Histograms ([page 481](#))
- Tables ([page 484](#))
- Box Plots ([page 487](#))
- Linear and Exponential Growth ([page 489](#))
- Interpreting Constants and Functions ([page 492](#))

Geometry—Area, Perimeter, and Volume

- Rectangle Area ([page 507](#))
- Triangle Area ([page 507](#))
- Perimeter of Polygons ([page 508](#))
- Parallelogram Area ([page 509](#))
- Trapezoid Area ([page 509](#))
- Surface Area ([page 510](#))
- Volume of a Box, Cylinder, Sphere, Cone, and Pyramid ([pages 512–514](#))

Geometry and Trigonometry—Lines, Angles, and Triangles

- Supplementary Angles ([page 521](#))
- Vertical Angles ([page 522](#))

- Parallel Lines and a Transversal ([page 522](#))
- Angles, Triangles, and Quadrilaterals ([page 524](#))

Trigonometry—Right Triangles and Trigonometry

- Pythagorean Theorem and Special Right Triangles ([page 532](#))
- Sine, Cosine, Tangent ([page 535](#))
- Area of an Equilateral Triangle ([page 536](#))
- Sine and Cosine of Complementary Angles ([page 537](#))

Geometry—Circles

- Radius and Diameter ([page 542](#))
- Area and Circumference ([page 543](#))
- 360° in a Circle ([page 543](#))
- Inscribed Angle ([page 544](#))
- Arc Length ([page 545](#))
- Sector Area ([page 546](#))
- Circle Formula ([page 547](#))
- Radians ([page 548](#))

Algebra

This section contains comprehensive review and strategies for all of the concepts below:

Algebra—Fundamentals

- Order of Operations
- FOIL
- Least Common Multiple and Greatest Common Factor
- Fractions

Algebra—Solving Equations

- Substitution
- Elimination
- Pattern Recognition
- Plugging in Choices
- Inequalities
- Absolute Value
- Function Notation

Algebra—Word Problems and Function Interpretation

- Setting Up Word Problems
- Distance, Rate, and Time
- Interpreting Variables and Constants
- Functions in Table Form

Algebra—Lines and Slope

- Slope Formula
- Slope-Intercept Form of a Line
- Overlapping and Intersecting Lines
- Parallel and Perpendicular Lines

Algebra—Fundamentals

Order of Operations

To remember the correct order of operations, use the popular acronym **PEMDAS**: *Please Excuse My Dear Aunt Sally*.

<u>P</u> lease <u>E</u> xcuse	<u>M</u> y <u>D</u> ear	<u>A</u> unt <u>S</u> ally
<u>P</u> arentheses () and other grouping symbols, like $\sqrt{\quad}$ or {} <u>E</u> xponents x^y	<u>M</u> ultiplication $x \times y$ <u>D</u> ivision $x \div y$	<u>A</u> ddition $x + y$ <u>S</u> ubtraction $x - y$

➤ Example 1

$$3(2 + 5)^2 - 4 = ?$$

✓ Solution

To simplify the above expression, calculate what is within the parentheses first and square it.

Then multiply that number by 3. Finally, subtract 4 to get your answer.

$$\begin{aligned} 3(2 + 5)^2 - 4 &\rightarrow 3(7)^2 - 4 \rightarrow \\ 3 \times 49 - 4 &\rightarrow 147 - 4 = 143 \end{aligned}$$

➤ Example 2

$$-\sqrt{\frac{64}{9}} = ?$$

✓ Solution

Calculate the square root of the numerator and denominator, and multiply the total by -1 .

$$-\sqrt{\frac{64}{9}} \rightarrow -\frac{\sqrt{64}}{\sqrt{9}} \rightarrow -\frac{8}{3}$$

Practice

Simplify the following expressions.

$$2x + 3x = ?$$

$$5(2 - 4x) = ?$$

$$5(x^2) + 2(x - 3) = ?$$

$$\frac{3+7}{2} - \frac{4}{2} = ?$$

$$4 + 2)^2 - \frac{12}{2} = ?$$

Solutions

$$2x + 3x = 5x$$

$$5(2 - 4x) = 5 \times 2 - 5 \times 4x = 10 - 20x$$

$$5(x^2) + 2(x - 3) = 5x^2 + 2x - 6$$

$$\frac{3+7}{2} - \frac{4}{2} = \frac{10}{2} - 2 = 5 - 2 = 3$$

$$4 + 2)^2 - \frac{12}{2} = (6)^2 - 6 = 36 - 6 = 30$$

FOIL

Simplify polynomials by “**FOIL**ing” the parts of an expression like $(a + b)(c + d)$ in this order:

First, Outer, Innner, Last.

$$(a + b)(c + d) = ?$$

$$\text{First} = ac \quad \text{Outer} = ad \quad \text{Inner} = bc \quad \text{Last} = bd$$

$$\text{Combine them: } ac + ad + bc + bd$$

► Example

$$(2 + x)(3 - y) = ?$$

✓ Solution

$$(2 + x)(3 - y) \rightarrow$$

$$\text{First} = 2 \times 3 \quad \text{Outer} = 2 \times (-y)$$

$$\text{Inner} = x \times 3 \quad \text{Last} = x \times (-y)$$

$$\text{So, it equals } 6 - 2y + 3x - xy$$

Practice

$$(x + 1)(x + 2) = ?$$

$$(-3 + x)(-4 + x) = ?$$

$$(2 - y)(3 + y) = ?$$

$$(2x + 1)(2x - 1) = ?$$

$$(2x - 5)(3 + 4x) = ?$$

Solutions

$$(x + 1)(x + 2) =$$

$$x^2 + 2x + 1x + 2 =$$

$$x^2 + 3x + 2$$

$$(-3 + x)(-4 + x) =$$

$$(-3)(-4) + (-3)x + (-4)x + x^2 =$$

$$12 - 7x + x^2$$

$$(2 - y)(3 + y) =$$

$$2 \times 3 + 2 \times y + (-y) \times 3 + (-y) \times y =$$

$$6 + 2y - 3y - y^2 =$$

$$6 - y - y^2$$

$$(2x + 1)(2x - 1) =$$

$$2x(2x) - 1(2x) + 1(2x) - 1^2 =$$

$$\begin{aligned} & \downarrow x^2 - 2x + 2x - 1 = \\ & \downarrow x^2 - 1 \end{aligned}$$

$$\begin{aligned} & (2x - 5)(3 + 4x) = \\ & \downarrow (2x) + (2x)(4x) + (-5)(3) + (-5)(4x) = \\ & \downarrow 2x + 8x^2 - 15 - 20x = \\ & \downarrow x^2 - 14x - 15 \end{aligned}$$

Least Common Multiple and Greatest Common Factor

A multiple of a number is the result when the number is multiplied by a whole number, i.e., an integer. For example, multiples of 3 include 3, 6, 9, and 12.

The least common multiple (LCM) of two numbers is the *least* value that some numbers share as a *common multiple*.

► Example

What is the least common multiple of 6 and 8?

✓ Solution

Multiples of 6 include 6, 12, 18, and 24.

Multiples of 8 include 8, 16, and 24.

So, the least number that 6 and 8 have in common as a multiple is 24.

Factors of a number are numbers that can be multiplied together to give that number. For example, factors of 10 include 1, 2, 5, and 10 since $1 \times 10 = 10$ and $2 \times 5 = 10$.

The greatest common factor (GCF) of two numbers is the *greatest factor* that the numbers have in *common*.

► Example

What is the greatest common factor of 8 and 12?

✓ Solution

Factors of 8 are 1, 2, 4, and 8. Factors of 12 are 1, 2, 3, 4, 6, and 12.

So the greatest common factor between the two is 4 since it is the greatest factor that 8 and 12 share.

Practice

What are five multiples of the number 4?

What are the factors of the number 15?

How many factors does 7 have?

What is the least common multiple of 4 and 5?

What is the greatest common factor of 6 and 9?

Solutions

Multiples of 4 could include 4, 8, 12, 16, 20, 24, 28, and so on.

Factors of 15 are 1, 3, 5, and 15

7 is a prime number, which has just *two* factors—1 and itself (7).

Multiples of 4: 4, 8, 12, 16, 20, etc. Multiples of 5: 5, 10, 15, 20, etc. So, the least common multiple between them is 20.

Factors of 6 are 1, 2, 3, and 6. Factors of 9 are 1, 3, and 9. So the greatest common factor between them is 3.

Solving Fractions

Examples of fractions include numbers like $\frac{1}{3}$, $\frac{5}{7}$, and $\frac{6}{11}$. The *numerator* is on *top* of a fraction, and the *denominator* is on the *bottom*:

$$\frac{\text{Numerator}}{\text{Denominator}}$$

For example, in the fraction $\frac{2}{3}$, 2 is the numerator and 3 is the denominator.

Fractions equal one another as long as the ratio of the numerator to the denominator is equivalent. For example, $\frac{3}{4}$, $\frac{6}{8}$, and $\frac{9}{12}$ are all equivalent

since they are all equal to 0.75. Putting a fraction in its “lowest term” simplifies the fraction so that the numerator and denominator only have 1 as a common factor. For the group of $\frac{3}{4}$, $\frac{6}{8}$, and $\frac{9}{12}$, $\frac{3}{4}$ is the lowest term since 3 and 4 only share 1 as a common factor.

If fractions have the same denominator, the fractions can be added or subtracted by adding or subtracting the numerators.

► Example 1

$$\frac{5}{13} + \frac{3}{13} = ?$$

✓ Solution

$$\frac{5}{13} + \frac{3}{13} = \frac{5+3}{13} = \frac{8}{13}$$

To add and subtract fractions that do not have the same denominator, change the fractions so they have a *common denominator*.

► Example 2

$$\frac{2}{3} + \frac{1}{4} = ?$$

✓ Solution

To provide a common denominator, 3 and 4 can be multiplied together. So that the fractions retain their values, multiply both the numerator and denominator of each fraction by a ratio equivalent to 1 (i.e., $\frac{4}{4}$ or $\frac{3}{3}$).

$$\begin{aligned}\frac{2}{3} + \frac{1}{4} &= \frac{2}{3} \times \frac{4}{4} + \frac{1}{4} \times \frac{3}{3} = \\ \frac{2 \times 4}{3 \times 4} + \frac{1 \times 3}{4 \times 3} &= \frac{8}{12} + \frac{3}{12} = \frac{11}{12}\end{aligned}$$

► Example 3

The time it takes Henry to mop a certain floor is 10 minutes, and the time it takes Tanner to mop the same floor is 8 minutes. What is the time it takes to mop the floor if both of them work together the full amount of time to do so (use the combined work formula below to solve)?

Combined Work Formula:

$$\frac{1}{t_c} = \frac{1}{t_a} + \frac{1}{t_b}$$

t_a = Time for a to complete the work

t_b = Time for b to complete the work

t_c = Time for both a and b to complete the work

✓ Solution

Using the combined worked formula above, we can calculate the time it will take both Henry and Tanner to complete the mopping. We can use 10 minutes as time a and 8 minutes as time b .

$$\frac{1}{t_c} = \frac{1}{t_a} + \frac{1}{t_b} \rightarrow$$

$$\frac{1}{t_c} = \frac{1}{8} + \frac{1}{10} \rightarrow \text{Use 40 as the least common denominator} \rightarrow$$

$$\frac{1}{t_c} = \frac{5}{5} \times \frac{1}{8} + \frac{4}{4} \times \frac{1}{10}$$

$$\frac{1}{t_c} = \frac{5}{40} + \frac{4}{40} \rightarrow$$

$$\frac{1}{t_c} = \frac{9}{40} \rightarrow \text{Flip the fractions to solve} \rightarrow$$

$$t_c = \frac{40}{9}$$

So, it will take $\frac{40}{9}$ minutes, or about 4.44 minutes, for both of them working together to mop the floor.

Use this rule to *multiply* fractions:

$$\frac{a}{b} \times \frac{c}{d} = \frac{ac}{bd} \quad (\text{Neither } b \text{ nor } d \text{ can equal zero, or it will be undefined.})$$

► Example 4

$$\frac{4}{7} \times \frac{2}{5} = ?$$

✓ Solution

$$\frac{4}{7} \times \frac{2}{5} = \frac{4 \times 2}{7 \times 5} = \frac{8}{35}$$

Use this rule to *divide* fractions—flip the second fraction and multiply the first one by it: $\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \times \frac{d}{c}$ (b , c , and d cannot equal zero, or it will be undefined.)

► Example 5

$$\frac{4}{5} \div \frac{1}{2} = ?$$

✓ Solution

$$\frac{4}{5} \div \frac{1}{2} = \frac{4}{5} \times \frac{2}{1} = \frac{4 \times 2}{5 \times 1} = \frac{8}{5}$$

Practice

$$\frac{1}{2} + \frac{1}{2} = ?$$

$$\frac{3}{4} - \frac{1}{4} = ?$$

$$\frac{2}{3} \times \frac{3}{5} = ?$$

$$\frac{3}{7} \div \frac{2}{5} = ?$$

$$\frac{3}{5} + \frac{1}{10} = ?$$

$$\frac{2}{3} - \frac{1}{6} = ?$$

Solutions

$$\frac{1}{2} + \frac{1}{2} = \frac{1+1}{2} = \frac{2}{2} = 1$$

$$\frac{3}{4} - \frac{1}{4} = \frac{3-1}{4} = \frac{2}{4} = \frac{1}{2}$$

$$\frac{2}{5} \times \frac{3}{5} = \frac{2 \times 3}{5 \times 5} = \frac{6}{25}$$

$$\frac{3}{7} \div \frac{2}{5} = \frac{3}{7} \times \frac{5}{2} = \frac{15}{14}$$

$$\frac{3}{5} + \frac{1}{10} = \frac{3}{5} \times \frac{2}{2} + \frac{1}{10} = \frac{6}{10} + \frac{1}{10} = \frac{7}{10}$$

$$\frac{2}{3} - \frac{1}{6} = \frac{2}{3} \times \frac{2}{2} - \frac{1}{6} = \frac{4}{6} - \frac{1}{6} = \frac{3}{6} = \frac{1}{2}$$

Algebra—Solving Equations

Substitution

When there is a system of two equations and two variables, it is often easiest to substitute an expression in terms of the other variable for one of the variables. That way, there is just one variable to work with.

► Example

What is the value of x in the set of equations below?

$$y = x + 1$$

$$x + y = 3$$

✓ Solution

To solve for x , use substitution of y in terms of x . Use the first equation, $y = x + 1$, to put everything in terms of x in the second equation:

$$x + y = 3 \rightarrow$$

$$x + (x + 1) = 3 \rightarrow$$

$$2x + 1 = 3 \rightarrow 2x = 2 \rightarrow x = 1$$

Elimination

If two equations have similar formats, eliminating variables can be the easiest approach to solving the system of equations. Use multiplication to reformat one of the equations so that it can be easily added or subtracted from the other equation, eliminating one of the variables.

➤ Example 1

$$2x + y = 7$$

$$3x - y = 3$$

What is the value of x in the above system of equations?

✓ Solution

Recognize that if you add the two equations together, the y values will cancel, leaving you only with x .

$$\begin{array}{r} 2x + y = 7 \\ + (3x - y = 3) \\ \hline 5x + 0 = 10 \rightarrow 5x = 10 \rightarrow x = 2 \end{array}$$

➤ Example 2

What are the values of x and y in the system of equations below?

$$3x + 4y = 1$$

$$2x - 2y = 10$$

✓ Solution

Use elimination to solve this. If you multiply the second equation by 2, you will be able to eliminate the y variables and can then solve for x .

$$\begin{array}{r} 3x + 4y = 1 \\ + 2 \times (2x - 2y = 10) \rightarrow \end{array}$$

$$\begin{array}{r} 3x + 4y = 1 \\ + 4x - 4y = 20 \\ \hline 7x + 0 = 21 \rightarrow \end{array}$$

$$7x = 21 \rightarrow x = 3$$

Then, plug 3 in for x into one of the equations to solve for y :

$$\begin{array}{r} 3x + 4y = 1 \rightarrow \\ 3(3) + 4y = 1 \rightarrow \\ 9 + 4y = 1 \rightarrow 4y = -8 \rightarrow y = -2 \end{array}$$

So, the solution set is $x = 3$ and $y = -2$.

Pattern Recognition

An excellent shortcut you can use to solve equations is to see if there is a pattern that will allow you to easily rearrange the equations without having to use substitution or elimination. If the SAT asks you to solve a problem in terms of an *expression* rather than just a *variable*, odds are that you can use pattern recognition to figure it out.

► Example

Given that $3(x + 4) = 2(x + 4) + 5$, what is the value of $x + 4$?

✓ Solution

While you could distribute the 3 and the 2 through the values in the parentheses and solving for x by itself, make things easier by just solving for $x + 4$ as a whole.

$$3(x + 4) = 2(x + 4) + 5 \rightarrow$$

Subtract $2(x + 4)$ from both sides $\rightarrow$

$$\begin{aligned} 3(x + 4) - 2(x + 4) &= 2(x + 4) - 2(x + 4) + 5 \rightarrow \\ x + 4 &= 5 \end{aligned}$$

You will find far more pattern recognition types of problems on the SAT Math than you are accustomed to finding in your typical math class questions. Be on look out for them to save you time.

Pattern Recognition: Infinite Solutions

Building off the material in the Algebra Fundamentals, be able to recognize when there are infinite solutions to a system of equations.

If two equations with two variables can be simplified to be the same equation, there will be infinite solutions. Another way to think about it—if the lines have the same slopes and the same y -intercepts, they will overlap and there will be infinitely many solutions.

► Example

How many solutions does the following system of equations have?

$$\begin{aligned} x - 2y &= 4 \\ 2x - 4y &= 8 \end{aligned}$$

✓ Solution

Divide the second equation by 2 and you will see that it is identical to the first equation:

$$\begin{aligned} 2x - 4y = 8 &\rightarrow \frac{2x - 4y}{2} = \frac{8}{2} \rightarrow \\ x - 2y &= 4 \end{aligned}$$

Since the two equations can be written the same way, there will be infinitely many sets of points that can be plugged in for x and y to be solutions for the set of equations.

Pattern Recognition: Zero Solutions

If two equations written in linear form have identical slopes and different y -intercepts, they will be parallel to each other and never intersect. Therefore, there will be zero solutions between them.

› Example

How many solutions does the following system of equations have?

$$\begin{aligned}y &= 3x - 4 \\ y &= 3x + 12\end{aligned}$$

✓ Solution

Recall the slope-intercept form of a line: $y = mx + b$. If the lines have the same slope and different y -intercepts, they will run parallel to each other.

$$\begin{aligned}y &= mx + b \\ y &= 3x - 4 \\ y &= 3x + 12\end{aligned}$$

These two lines have the same slope of 3, and different y -intercepts of -4 and 12 . So, they will run parallel to each other, resulting in no solutions to the system of equations.

Plugging in Choices

Sometimes it can save you time to simply plug in the answer choices to see what the answer would be. Do this when it looks like plugging in the choices will ultimately take you less time than solving the problem using algebra.

› Example

$$|3x + 1| = 7$$

What value of x is a positive number that would be a solution to the above equation?

- (A) 1
- (B) 2
- (C) 3
- (D) 4

✓ Solution

While it would be possible to solve this using algebra, you will likely save time by working backwards from the choices. Since the choices on the SAT Math are consistently in order from least to greatest, start with one of the middle choices like (B) or (C). That way, if your answer is too big you can try the smaller answers, and if it is too small you can try the larger answers.

Plug in choice (C) first:

$$\begin{aligned} |3x + 1| &= 7 \rightarrow \\ |3(3) + 1| &= 10 \end{aligned}$$

So, 3 is too large of an answer. Let us now try the next smallest answer, choice (B):

$$\begin{aligned} |3x + 1| &= 7 \rightarrow \\ |3(2) + 1| &= 7 \end{aligned}$$

SAT Math Strategy

Save time by recognizing when substitution, elimination, pattern recognition, or plugging in choices will be the most efficient way to solve a system of equations.

This works, so the correct answer is choice **(B)**.

This table breaks down how to recognize which strategy will likely be most efficient.

	When to Use	Example	Solution
Substitution	If one variable can easily be expressed as the other variable, use substitution.	What is x in the system of equations below? $y = 7x - 4$ $3x + 2y = 5$	<i>Plug $y = 7x + 4$ in for y in the second equation to solve.</i> $3x + 2(7x - 4) = 5 \rightarrow$ $3x + 14x - 8 = 5 \rightarrow$ $17x = 12 \rightarrow x = \frac{12}{17}$
Elimination	If one equation can be easily modified so that one variable will cancel when the equations are combined, use elimination.	What is x in the system of equations below? $6x - 3y = 7$ $4x + 3y = 5$	<i>Add the two equations together to eliminate the y components.</i> $6x - 3y = 7$ $+ 4x + 3y = 5$ $\hline 10x + 0 = 12 \rightarrow$ $x = \frac{12}{10} = \frac{6}{5}$
Pattern Recognition	If the question asks for the value of an expression instead of a variable, watch out for pattern recognition.	What is the value of $5x - 1$ in the equation below? $\frac{5x - 1}{3} = 4$	<i>Simplify the equation to look like $5x - 1$ multiplying both sides by 3.</i> $\frac{5x - 1}{3} = 4 \rightarrow$ $5x - 1 = 4 \times 3 = 12$
Plugging in Choices	When you can more easily plug in the answers than solve the problem with algebra, plug in the choices starting with the middle values.	What is a possible value for x in this inequality? $5x > -2x - 4$ (A) 0 (B) -1 (C) -2 (D) -3	Since the algebra could be a little tricky, you could work backwards from the choices and find that choice (A), 0, is the only option that will make this true.

Practice

What is the value of x in this series of equations?

$$y = x - 3$$

$$y + 2x = 9$$

What is the value of y in this series of equations?

$$\begin{aligned} 3x - 2y &= 6 \\ -6x + 5y &= 4 \end{aligned}$$

What is the value of $3x^2$ in the equation $6x^2 - 4 = 8$?

What is the value of x in this series of equations?

$$\begin{aligned} 3x &= 6y + 9 \\ x + 2y &= 7 \end{aligned}$$

What is the solution set for (x, y) in this series of equations?

$$\begin{aligned} 4x - 3y &= 5 \\ 8x &= 6y + 10 \end{aligned}$$

What is the value of y in this series of equations?

$$\begin{aligned} \frac{1}{2}x + 2y &= -1 \\ 2x - 3y &= 7 \end{aligned}$$

How many solutions are there in this series of equations?

$$\begin{aligned} y &= 5x + \frac{1}{2} \\ 2y + 8 &= 10x \end{aligned}$$

If $|x - 4| \leq 2$, what is a possible value of x ?

Solutions

Substitute $x - 3$ in for y in the second equation to solve:

$$\begin{aligned} (x - 3) + 2x &= 9 \rightarrow \\ 3x - 3 &= 9 \rightarrow 3x = 12 \rightarrow x = 4 \end{aligned}$$

Double the first equation and then add it to the second to eliminate the x components:

$$2(3x - 2y = 6)$$

$$-6x + 5y = 4 \rightarrow$$

$$6x - 4y = 12$$

$$+(-6x + 5y = 4)$$

$$0 + y = 16 \rightarrow y = 16$$

Recognize that you can manipulate the equation fairly easily to isolate $3x^2$:

$$6x^2 - 4 = 8 \rightarrow$$

$$6x^2 = 12 \rightarrow$$

Divide both sides by 2 $\rightarrow$

$$3x^2 = 6$$

Simplify the first equation by dividing it by 3, then substitute it in to the second equation:

$$3x = 6y + 9 \rightarrow \text{Divide by 3} \rightarrow$$

$$x = 2y + 3$$

Substitute this in the second equation $\rightarrow$

$$(2y + 3) + 2y = 7 \rightarrow$$

$$4y + 3 = 7 \rightarrow 4y = 4 \rightarrow y = 1$$

Plug 1 in for y to solve for x :

$$x = 2y + 3 \rightarrow$$

$$x = 2(1) + 3 = 5$$

With a little bit of manipulation, you can see the pattern, which makes this easier to solve:

$$4x - 3y = 5$$

$$8x = 6y + 10$$

Manipulate the second equation to make it look like the first one:

$$8x = 6y + 10 \rightarrow 8x - 6y = 10 \rightarrow$$

Divide both sides by 2 $\rightarrow$

$$4x - 3y = 5$$

So, since the second equation is equivalent to the first equation, there are infinitely many solutions.

Use elimination to solve—multiply the first equation by -4 to make it possible to add and eliminate the x components:

$$\begin{aligned} -4\left(\frac{1}{2}x + 2y = -1\right) &= -2x - 8y = 4 \rightarrow \\ -2x - 8y &= 4 \\ +2x - 3y &= 7 \\ \hline 0 - 11y &= 11 \rightarrow y = -1 \end{aligned}$$

Recognize the pattern here by simplifying the second equation to get it in slope-intercept form:

$$2y + 8 = 10x \rightarrow 2y = 10x - 8 \rightarrow y = 5x - 4$$

Once this equation is in slope-intercept form, you can see that it has the same slope as the first equation, 5, and a different y -intercept. Therefore, the lines created by these two equations will never overlap or intersect, resulting in no solutions.

Although this is a fill-in question, you could still try plugging in potential answers to find one that would make this statement true. Since we know that $|x - 4| \leq 2$, we could pick a value that is less than 2 and plug that in: $|x - 4| = 1$. Based on this, 5 would be a possible value for x .

Alternatively, you could do this algebraically as follows:

$$|x - 4| \leq 2 \rightarrow$$

Break up the absolute value like this:

$$-2 \leq x - 4 \leq 2 \rightarrow$$

Add 4 to all parts of the expression:

$$\begin{aligned} -2 + 4 &\leq x - 4 + 4 \leq 2 + 4 \rightarrow \\ 2 &\leq x \leq 6 \end{aligned}$$

So, any number greater than or equal to 2 and less than or equal to 6 would work. As you can see, plugging in potential solutions would likely save you time.

Inequalities

An inequality indicates which value is greater than or less than another value. The open end of the $>$ goes toward the larger number. For example:

$$-3 < 0 \text{ and } 10 > 4$$

A line underneath a greater/less than sign indicates that the terms on either side can possibly equal one another. For example:

$8 \geq n$ means that n is less than or equal to 8, or alternatively, that 8 is greater than or equal to n .

Inequalities can be solved like typical equations, with an important exception:

If multiplying or dividing a side of the inequality by a negative number, change the direction of the inequality sign.

Example

Simplify the expression $-4x > 3$.

Solution

$$-4x > 3$$

Divide both sides by -4 and turn the $>$ around to $<$.

$$\frac{-4x}{-4} < \frac{3}{-4}$$

$$\frac{-4x}{-4} < \frac{3}{-4}$$

$$x < -\frac{3}{4}$$

Practice

How would one express that x represents all the numbers greater than or equal to 14?

If $x > 4$ and $x < 9$, what is a possible value for x ?

Simplify $-2x + 4 > 6$.

Solutions

$x \geq 14$

The values of x must be greater than 4 and less than 9, so any number between 4 and 9 would work. (Note—it would not include 4 or 9 themselves since the expressions do not indicate equality.)

$$-2x + 4 > 6 \rightarrow$$

$$-2x > 2 \rightarrow$$

Divide both sides by -2 and flip the sign:

$$x < \frac{2}{-2} \rightarrow x < -1$$

Absolute Value

When you take the absolute value of a number, it represents how far that number is from zero. If you took the absolute value of -6 or 6 , both would be 6 since they are both 6 units away from zero.

Absolute value is written by putting two lines around the number—for example, the absolute value of 4 would be written as $|4|$. Calculate the absolute value of an expression by making the expression positive, no matter if the expression is originally positive or negative. Here are some absolute value expressions:

$$|8| = 8$$

$$|-5| = 5$$

$$\left|-\frac{1}{2}\right| = \frac{1}{2}$$

To solve a typical absolute value equation, set it up as two equations—one with a positive and one with a negative value. (If the absolute value expression equals zero, there will be just one solution; if the absolute value expression equals a negative number, there will be zero solutions.)

► Example

What are the possible values for x in the equation $|x + 1| = 5$?

✓ Solution

$|x + 1| = 5$ can be set up as two different equations:

$$x + 1 = 5$$

$$x + 1 = -5$$

Solve each equation for x to find the solutions:

$$x + 1 = 5 \rightarrow x = 4$$

$$x + 1 = -5 \rightarrow x = -6$$

So x could be either 4 or -6 .

Practice

What is the value of $|4 - 7|$?

What are the possible values of x in the equation $|x - 1| = 5$?

Given that x is a real number, what is the least possible value for $|x|$?

Solutions

$$|4 - 7| \rightarrow |-3| \rightarrow 3$$

Set it up as two separate equations:

$$x - 1 = 5$$

$$x - 1 = -5$$

Then solve each equation for x :

$$x - 1 = 5 \rightarrow x = 6$$

$$x - 1 = -5 \rightarrow x = -4$$

So, x could be either 6 or -4 .

If you take the absolute value of any real number, it will be the positive value of that number. So, the least possible value for x is found when you take the absolute value of zero: $|0| = 0$. Therefore, zero is the least possible value for $|x|$.

Function Notation

Many of the expressions you encounter on the SAT Math will be equations with x and y values.

However, be sure you understand function notation:

$f(x) = 2x + 1$ is the same as $y = 2x + 1$; $f(x)$ corresponds to the y value.

If you were told that $f(x) = 3x - 5$ and asked to find the value of $f(4)$, simply plug 4 in for x into the function:

$$f(x) = 3x - 5$$

$$f(4) = 3(4) - 5 = 12 - 5 = 7$$

Finally, you may be asked to combine functions together. Be sure you work from the “inside out” to solve these.

► Example

If $f(x) = 4x - 3$ and $g(x) = 2x + 1$, what is $g(f(2))$?

✓ Solution

Start by calculating the value of $f(2)$:

$$f(x) = 4x - 3$$

$$f(2) = 4(2) - 3 = 8 - 3 = 5$$

Then, take 5 and plug it into $g(x)$:

$$g(x) = 2x + 1$$

$$g(5) = 2(5) + 1 = 11$$

Practice

If x is 4, what is $f(x)$ if $f(x) = 2x - 5$?

If x is 8 and $f(x) = x - 4$, what is the value of $3f(x)$?

If $f(x) = x^2$ and $g(x) = \frac{x}{2}$, what is $f(g(4))$?

Solutions

1. Plug 4 in for x to the function:

$$f(x) = 2x - 5$$

$$f(4) = 2(4) - 5 = 8 - 5 = 3$$

2. First, determine the value of $f(x)$ by plugging in 8 for x :

$$f(x) = x - 4$$

$$f(8) = 8 - 4 = 4$$

Then, multiply 4 by 3 to see what $3f(x)$ would be:

$$4 \times 3 = 12$$

3. Work inside out to solve. First, determine $g(4)$:

$$g(x) = \frac{x}{2}$$

$$g(4) = \frac{4}{2} = 2$$

Then, plug 2 into $f(x)$:

$$f(x) = x^2$$

$$f(x) = 2^2 = 4$$

Practice Drill #1—Solving Equations

(If timing, take about 12 minutes to complete.)

1. $6 = 5x + 1$

What is the solution for x in the equation above?

- (A) 0
- (B) 1
- (C) 2
- (D) 3

2. What value of x satisfies the equation $13x + 3 = 42$?

- (A) 3
- (B) 5
- (C) 7
- (D) 10

3. $1.2x - 2.4 = 3.6$

What value of x is a solution to the above equation?

- (A) 4
- (B) 5
- (C) 6
- (D) 7

4. $-|y + 5| = -4$

What are the solutions to the equation above?

- (A) 1 or -3

- (B) 1 or -9
- (C) -1 or 9
- (D) -1 or -9

5. What is the solution set for x and y at which these two lines would intersect?

$$\begin{aligned}3x - y &= 2 \\ -4x + 2y &= 2\end{aligned}$$

- (A) (3, 7)
- (B) (1, 6)
- (C) $(-4, 5)$
- (D) (2, -1)

$$5(a - 1) - 2(a + 2) = \frac{3}{4}a$$

6. What is the value of a in the above equation?

- (A) 2
- (B) 3
- (C) 4
- (D) 5

$$\begin{aligned}3x - 2y &= 7 \\ -6y + 4x &= 12\end{aligned}$$

7. Consider the system of equations above. What is the value of $7x - 8y$?

- (A) 7
- (B) 8
- (C) 14
- (D) 19

8. $3x - 2 \leq 2x + 3$

What is the greatest possible number that would work for x in the above inequality?

- (A) 3
- (B) 5
- (C) 8
- (D) 9

9. $2y = -6x + 14$

$$\frac{2}{3}y = -2x + 1$$

How many solutions are there to the above system of equations?

- (A) Zero
- (B) One
- (C) Two
- (D) Infinite

10. $\frac{1}{2}x - \frac{2}{3}y = 18$
 $\frac{3}{4}x + 2y = 36$

Based on the system of equations above, what is the product of x and y ?

- (A) 30
- (B) 80
- (C) 120
- (D) 180

Solutions

1. (B) $6 = 5x + 1 \rightarrow$
 $5 = 5x \rightarrow$
 $1 = x$

2. (A) $13x + 3 = 42 \rightarrow$

$$13x = 39 \rightarrow$$

$$x = 3$$

3. **(B)** $1.2x - 2.4 = 3.6 \rightarrow$
 $1.2x = 6.0 \rightarrow$
 $x = \frac{6.0}{1.2} = 5$

4. **(D)** $-|y + 5| = -4 \rightarrow$
 $|y + 5| = 4 \rightarrow$

Make two separate equations and solve:

$$y + 5 = 4 \rightarrow y = -1$$

or

$$y + 5 = -4 \rightarrow y = -9$$

5. **(A)** Use elimination to solve this series of equations, since the y 's can be easily cancelled if you multiply the first equation by 2:

$$2(3x - y) = 2 \times 2 \rightarrow$$

$$6x - 2y = 4$$

Then, add this to the second equation to eliminate:

$$\begin{array}{r} 6x - 2y = 4 \\ -4x + 2y = 2 \\ \hline 2x + 0 = 6 \rightarrow 2x = 6 \rightarrow x = 3 \end{array}$$

Fortunately, the only answer that has a 3 for the x value is choice **(A)**, so you do not need to bother solving for y .

6. **(C)** $5(a - 1) - 2(a + 2) = \frac{3}{4}a \rightarrow$

$$\begin{aligned}
5a - 5 - 2a - 4 &= \frac{3}{4}a \rightarrow \\
3a - 9 &= \frac{3}{4}a \rightarrow \\
-9 &= \frac{3}{4}a - 3a \rightarrow \\
-9 &= \frac{3}{4}a - \frac{12}{4}a \rightarrow \\
-9 &= -\frac{9}{4}a \rightarrow \\
-9 \times -\frac{4}{9} &= 4 = a
\end{aligned}$$

7. **(D)** Although the equations present the x and y values in different orders, do your best to recognize that if you add these two equations together you will have the expression $7x - 8y$:

$$\begin{aligned}
3x - 2y &= 7 \\
-6y + 4x &= 12
\end{aligned}$$

Change the order of the second equation, and add it to the first one:

$$\begin{aligned}
3x - 2y &= 7 \\
+ 4x - 6y &= 12 \\
\hline
7x - 8y &= 19
\end{aligned}$$

8. **(B)** Simplify the inequality in order to see what the largest potential value for x could be:

$$\begin{aligned}
3x - 2 &\leq 2x + 3 \rightarrow \\
3x &\leq 2x + 5 \rightarrow \\
x &\leq 5
\end{aligned}$$

Since x can be any value less than or equal to 5, the largest possible value it could be is 5.

9. **(A)** The two equations can be simplified to be in slope-intercept form:

$$2y = -6x + 14$$

$$y = -3x + 7$$

And:

$$\frac{2}{3}y = -2x + 1 \rightarrow$$

$$y = \frac{3}{2}(-2x + 1) \rightarrow$$

$$y = -3x + 1.5$$

So, the lines have the same slope, which makes them parallel. They also have different y -intercepts, which means they do not intersect or overlap. Therefore, there are no points of intersection for the two lines and zero solutions.

10. (C) Multiply the first equation by 3 so that you can add the equations together and eliminate y .

$$\frac{1}{2}x - \frac{2}{3}y = 18 \rightarrow$$

$$\frac{3}{2}x - 2y = 54$$

Now, add this equation to the second equation to eliminate the y 's:

$$\begin{array}{r} \frac{3}{2}x - 2y = 54 \\ + \frac{3}{4}x + 2y = 36 \\ \hline \frac{9}{4}x + 0 = 90 \rightarrow \frac{9}{4}x = 90 \rightarrow \frac{4}{9} \times 90 = 40 = x \end{array}$$

Now, plug 40 back in for x to one of the equations to solve for y :

$$\frac{1}{2}x - \frac{2}{3}y = 18 \rightarrow$$

$$\frac{1}{2}(40) - \frac{2}{3}y = 18 \rightarrow$$

$$20 - \frac{2}{3}y = 18 \rightarrow -\frac{2}{3}y = 18 - 20 \rightarrow$$

$$-\frac{2}{3}y = -2 \rightarrow \left(-\frac{3}{2}\right) \times -2 = 3 = y$$

Now, multiply 3 and 40 together to give you 120.

Practice Drill #2—Solving Equations

(If timing, take about 12 minutes to complete.)

1. $5x + 4 = -6$

In the equation above, what is the value of x ?

- (A) -2
- (B) -1
- (C) 0
- (D) 1

2. If $-5(x - 3) + 2(x + 6) = 12$, what is the value of x ?

- (A) 3
- (B) 5
- (C) 8
- (D) 9

3. If $\frac{5a}{2} = \frac{3}{7}$, what is the value of a ?

- (A) $\frac{6}{35}$
- (B) $\frac{10}{21}$
- (C) $\frac{14}{15}$
- (D) $\frac{7}{6}$

4. $y > 7$ and $y - 4 < 3x$

Based on the system of inequalities above, what are the possible values for x ?

- (A) $x < 0$

- (B) $x > 3$
- (C) $x < -11$
- (D) $x > 1$

5. If $y + 1 > 2x$ and $y > 3x + 2$, which ordered pair would satisfy the system of inequalities?

- (A) $(-3, 5)$
- (B) $(2, -4)$
- (C) $(1, 2)$
- (D) $(4, 0)$

Fill-In Practice: Write your answer in the underlined blank under each question.

6. $11x + 3y = 7$
 $6x + 8y = 5$

If (x,y) is a solution to the above system of equations, what is the value of $5x - 5y$?

Answer: _____

7. Consider this series of equations:

$$\begin{aligned}x + 2y &= 5 \\ y - x &= -2\end{aligned}$$

What is the value of y ?

Answer: _____

8. $2x - y = -1$
 $2x + y = 7$

If (x,y) is a solution to the above series of equations, what is the value of x ?

Answer: _____

9. For the function g , if $g(5x - 1) = x + 4$, what is the value of $g(4)$?

Answer: _____

10. $3x - 2y = 7$
 $x + y = 9$

In the system of equations above what is the value of x ?

Answer: _____

Solutions

1. (A) $5x + 4 = -6 \rightarrow$
 $5x = -10 \rightarrow$
 $x = -\frac{10}{5} = -2$

2. (B) $-5(x - 3) + 2(x + 6) = 12 \rightarrow$
 $-5x + 15 + 2x + 12 = 12 \rightarrow$
 $-3x + 27 = 12 \rightarrow$
 $-3x = -15 \rightarrow x = 5$

3. (A) $\frac{5a}{2} = \frac{3}{7} \rightarrow$ Cross Multiply the 2 $\rightarrow$
 $5a = \frac{6}{7} \rightarrow$ Divide Both Sides by 5 $\rightarrow$
 $a = \frac{6}{7 \times 5} = \frac{6}{35}$

4. (D) Simplify $y - 4 < 3x$ to put it in terms of y :

$$y - 4 < 3x \rightarrow y = 3x + 4$$

Then combine the two inequalities, $y > 7$ and $y < 3x + 4$, and simplify:

$$\begin{aligned}
 7 < y < 3x + 4 &\rightarrow \\
 7 < 3x + 4 &\rightarrow \\
 3 < 3x \rightarrow 1 < x \rightarrow x > 1
 \end{aligned}$$

5. **(A)** This is a good example of plugging in the choices to solve. Choice (A) is the only option that will be true for both the x and y values in the pair:

$$\begin{aligned}
 y + 1 &> 2x \rightarrow \\
 (5) + 1 &> 2(-3) \rightarrow \\
 6 &> -6
 \end{aligned}$$

And:

$$\begin{aligned}
 y &> 3x + 2 \rightarrow \\
 (5) &> 3(-3) + 2 \rightarrow \\
 5 &> -9 + 2 \rightarrow \\
 5 &> -7
 \end{aligned}$$

6. **(2)** This is a great example of a pattern recognition problem. If you subtract the second equation from the first one, you will get it to look like $5x - 5y$:

$$\begin{array}{r}
 11x + 3y = 7 \\
 -(6x + 8y = 5) \\
 \hline
 5x - 5y = 2
 \end{array}$$

7. **(1)** If you add the two equations together, the x 's will cancel, leaving you with only the y term to analyze. Rearrange the second equation, $y - x = -2$, so that the x term comes first and it can be more easily added to the first equation:

$$\begin{array}{r}
 x + 2y = 5 \\
 +(-x + y = -2) \\
 \hline
 0 + 3y = 3 \rightarrow 3y = 3 \rightarrow y = 1
 \end{array}$$

8. **(1.5 or $\frac{3}{2}$)** This is a great example of an elimination question. Add the two equations together to eliminate the y :

$$\begin{array}{r} 2x - y = -1 \\ + 2x + y = 7 \\ \hline 4x + 0 = 6 \rightarrow 4x = 6 \rightarrow x = 1.5 \end{array}$$

9. **(5)** Since $g(4) = g(5x - 1)$, find out what the value of x is by solving the equation $4 = 5x - 1$:

$$4 = 5x - 1 \rightarrow 5 = 5x \rightarrow x = 1$$

Then, plug 1 in for x in the right-hand side of the function:

$$x + 4 \rightarrow 1 + 4 \rightarrow 5$$

So, the value of $g(4)$ is 5.

10. **(5)** If you double the second equation, $x + y = 9$, you can eliminate the y terms and solve for x :

$$\begin{array}{r} 3x - 2y = 7 \\ + 2x + 2y = 18 \\ \hline 5x + 0 = 25 \rightarrow 5x = 25 \rightarrow x = 5 \end{array}$$

Practice Drill #3—Solving Equations

(If timing, take about 12 minutes to complete.)

1. If $x - 3 = 0.5x$, what is the value of x ?

- (A) 2
- (B) 4
- (C) 6
- (D) 8

2. If $5(x + 4) - 3(x + 4) = 3x - 2$, what is the value of x ?

- (A) 3
- (B) 4
- (C) 7
- (D) 10

3. If $3x$ is 5 less than 20, what is $x + 4$?

- (A) 4
- (B) 6
- (C) 8
- (D) 9

4. $y + 5n = 3$

In the equation above, if $y = 2$, what is the value of n ?

- (A) $\frac{1}{5}$
- (B) 2
- (C) $\frac{7}{2}$
- (D) 6

5. If $\frac{4}{3y} = \frac{2}{3}$, what is the value of y ?

- (A) 1
- (B) 2
- (C) 6
- (D) 12

6. $y = 3x - 5$
 $y = 3x + k$

Consider the system of equations above. What must the value of the constant k be so that the system of equations has infinitely many solutions?

- (A) -15

- (B) -8
- (C) -5
- (D) 0

7. $4x + y = 3$
 $-3x - 2y = 4$

In the above system of equations, what is the point in the xy -coordinate plane at which the lines formed by the equations would intersect?

- (A) $(2, -5)$
- (B) $(6, -3)$
- (C) $(9, 0)$
- (D) $(12, 6)$

8. $y = x + 5$
 $2x + y = 11$

In the system of equations above, what is the value of x ?

- (A) 0
- (B) 2
- (C) 4
- (D) 6

9. If $|x + 2| > 0$, which of the following statements must be true?

- (A) $x = -6$
- (B) $x = 5$
- (C) $x \neq -2$
- (D) $x \neq 0$

10. If $f(x) = 2x - 1$, and $g(x) = 3f(x)$, what is the slope and y -intercept of the line formed by $g(x)$?

- (A) Slope = 3, y -intercept = -1
- (B) Slope = 4, y -intercept = -2
- (C) Slope = 6, y -intercept = 3
- (D) Slope = 6, y -intercept = -3

Solutions

$$\begin{aligned}
 1. \quad (C) \quad x - 3 &= 0.5x \rightarrow \\
 -3 &= 0.5x - x \rightarrow \\
 -3 &= -0.5x \rightarrow x = 6
 \end{aligned}$$

$$\begin{aligned}
 2. \quad (D) \quad 5(x + 4) - 3(x + 4) &= 3x - 2 \rightarrow \\
 5x + 20 - 3x - 12 &= 3x - 2 \rightarrow \\
 2x + 8 &= 3x - 2 \rightarrow \\
 8 &= x - 2 \rightarrow x = 10
 \end{aligned}$$

3. (D) Turn the words into an algebraic expression. “If $3x$ is 5 less than 20” is equivalent to:

$$\begin{aligned}
 3x &= 20 - 5 \rightarrow \\
 3x &= 15
 \end{aligned}$$

$$\text{Since } 3x = 15 \rightarrow x = 5$$

$$\text{Therefore, } x + 4 = 5 + 4 = 9$$

4. (A) Plug 2 in for y and then solve for n :

$$\begin{aligned}
 y + 5n &= 3 \rightarrow \\
 2 + 5n &= 3 \rightarrow \\
 5n &= 1 \rightarrow n = \frac{1}{5}
 \end{aligned}$$

In the equation above, if $y = -2$, what is the value of n ?

5. **(B)** $\frac{4}{3y} = \frac{2}{3} \rightarrow$ Cross Multiply $\rightarrow$

$$4 = \frac{2}{3} \times 3y \rightarrow \text{Cancel the 3s} \rightarrow$$

$$4 = 2y \rightarrow 2 = y$$

6. **(C)** Two equations will have infinitely many solutions if they overlap one another. Equations that have the same slope and y-intercept will overlap. Therefore, since the equations are already in slope-intercept form, make the constant k identical to the y-intercept in the first equation:

$$y = 3x - 5$$

So, the y-intercept is -5 and k should be -5 .

7. **(A)** Use elimination to find the point of intersection. Double the first equation and add it to the second equation to eliminate the y values:

$$2(4x + y) = 2(3) \rightarrow 8x + 2y = 6$$

Now add this to the second equation:

$$\begin{array}{r} 8x + 2y = 6 \\ + (-3x - 2y = 4) \\ \hline 5x + 0 = 10 \rightarrow 5x = 10 \rightarrow x = 2 \end{array}$$

Fortunately, the only option that has 2 as the x value is choice **(A)**, so you do not have to continue to solve for y .

8. **(B)** Use substitution to solve this series of equations.

$$\begin{array}{l} y = x + 5 \\ 2x + y = 11 \end{array}$$

Plug the first equation into the second one, then solve for x :

$$\begin{aligned}
2x + (x + 5) &= 11 \rightarrow \\
2x + x + 5 &= 11 \rightarrow \\
3x + 5 &= 11 \rightarrow \\
3x &= 6 \rightarrow x = 2
\end{aligned}$$

9. **(C)** Given that $|x + 2| > 0$, choices (A), (B), and (D) all *could* be true. However, the only choice that *must* be true is choice **(C)**. If x were equal to -2 , then the inequality would say that $0 > 0$, which cannot be the case.
10. **(D)** Plug $f(x) = 2x - 1$ into $g(x)$:

$$g(x) = 3(2x - 1) \rightarrow 6x - 3$$

Now, it is in slope-intercept form, and we can see that the slope is 6 and the y -intercept is -3 .

Algebra—Word Problems and Function Interpretation

Setting Up Word Problems

So far in this section, you have worked with how to execute algebraic operations. However, many SAT Math problems have you set up the algebra by asking detailed word problems. Here are some of the most common word problem phrases along with their corresponding mathematical operations.

SAT Math Strategy

Know which wording corresponds to which mathematical operations to help you solve word problems.

Wording Examples for Common Mathematical Operations	Operation
is, are, was, were, will be, equals, gives, yields, results in, costs, sells for	=

sum, plus, increased by, more than, together, combined, total(s), added to, greater than, older than, farther than	+
difference, decreased by, less than, fewer than, minus, after, left over, younger than, shorter than, smaller than	−
multiplied by, times, of, product of, twice, triple, quadruple	×
Divided by, per, out of, split, average, ratio of, half of, one third of	÷ or $\frac{x}{y}$

➤ Example 1

Translate this sentence into an algebraic expression:

There are a total of 40 pets at a store, with x dogs and y cats.

✓ Solution

$$40 = x + y$$

➤ Example 2

Translate these sentences into algebraic expressions:

Caitlin is 6 years older than Allison, and the sum of Allison's age and Caitlin's age is 60 years.

✓ Solution

Let's use C for Caitlin's age and A for Allison's age. Be careful to not to make the equation go in the order of the words if the algebra does not correspond. For the first half of the sentence, "Caitlin is 6 years older than Allison," the equation would be:

$$C = A + 6$$

The second half of the sentence, "the sum of Allison's age and Caitlin's age is 60 years," would look like this algebraically:

$$A + C = 60$$

► Example 3

A stoplight is always green, yellow, or red. It is green $\frac{3}{5}$ of the time and yellow $\frac{1}{4}$ of the remaining time. What fraction of the entire time is the light red?

Fill in: _____

✓ Solution

Read the question one step at time, writing out the relevant information. Since the stoplight is always green, yellow, or red, we can determine the fraction of time it *is not* red by subtracting the green, yellow, and red fractions from 1; the remaining fraction will indicate the fraction of the time it *is* red.

The light is green $\frac{3}{5}$ of the time. The time that it is remaining would be $1 - \frac{3}{5} = \frac{5}{5} - \frac{3}{5} = \frac{2}{5}$ of the time. Out of the $\frac{2}{5}$ of time remaining, it is yellow $\frac{1}{4}$ of time time. So, calculate the fraction of time it is yellow by multiplying $\frac{2}{5}$ and $\frac{1}{4}$:

$$\frac{2}{5} \times \frac{1}{4} = \frac{2}{20} = \frac{1}{10}$$

Then calculate the time it is red by subtracting $\frac{3}{5}$, the fraction of time it is green, and $\frac{1}{10}$, the fraction of time it is yellow, from 1:

$$1 - \frac{3}{5} - \frac{1}{10} \rightarrow$$

Use 10 as the least common denominator:

$$\frac{10}{10} - \frac{6}{10} - \frac{1}{10} = \frac{3}{10}$$

So, the light is red $\frac{3}{10}$ of the entire time.

Practice

Turn these sentences into algebraic expressions.

Pam read 40 pages of her book on Monday, 30 pages of her book on Tuesday, and x pages of her book on Wednesday for a total of 120 pages.

If Yusuf did 1 hour of homework on Sunday and twice as much homework on Monday, how many hours did he do on both of those days?

Dog x is 5 years older than dog y .

Sofia spends two-thirds out of the 24 hours in a day awake. How would you calculate the number of hours, h , she is asleep in a day?

The average weight of person A, B, and C is 150 pounds.

Solutions

$$40 + 30 + x = 120$$

$$1 + 2(1) = 3 \text{ total hours of homework}$$

Be sure you don't just read this left to right. It should be set up as the following:

$$x = y + 5$$

From this expression, you can see that x is 5 greater than y .

$$24 - \frac{2}{3} \times 24 = h \rightarrow$$

$$24 - 16 = h \rightarrow$$

$$8 = h$$

$$\frac{A + B + C}{3} = 150$$

Averages will be covered in-depth in the Problem Solving and Data Analysis section.

Distance, Rate, and Time

The relationship among distance, rate (speed), and time is given by the following formula:

$$DISTANCE = RATE \times TIME, \text{ or } D = RT$$

For example, if you were driving at 60 miles per hour for two hours, you would travel a total of 120 miles:

$$D = RT$$
$$120 \text{ Miles} = 60 \text{ MPH} \times 2 \text{ Hours}$$

> Example

Julia's family took a road trip in which they drove 8 hours a day and averaged a driving speed of 50 miles per hour. If they spent a total of 6 days on the trip, how far in total did they drive?

✓ Solution

Start by figuring out how far they drove on a given day:

$$D = RT \rightarrow$$
$$D = 50 \times 8 \rightarrow$$
$$\text{Distance} = 400 \text{ Miles}$$

Then, multiply the daily number of miles by 6 days to find the total number of miles travelled:

$$400 \times 6 = 2,400$$

So, they drove a total of 2,400 miles on the trip.

Interpreting Variables and Constants

SAT Math Strategy

Create your own idea of the meaning of a constant or variable before jumping into the options.

Sometimes, SAT word problems will not simply ask for you to solve for the value of a variable, but to interpret the significance of a constant or a variable.

► Example 1

A teacher is counting up his classroom supplies for inventory at the end of the year. T is equal to the number of textbooks in his classroom at the end of the year, and L is the equal to the number of laptop computers in his classroom at the end of the year. In the equation

$$T + L = 60, \text{ what does the number 60 represent?}$$

- (A) The product of the number of the laptops and the number of the textbooks at the end of the year in the teacher's classroom
- (B) The combined total number of laptops and textbooks at the end of the year in the teacher's classroom
- (C) The difference between the number of laptops and number of textbooks in the teacher's classroom at the end of the year
- (D) The predicted value of the number of laptops and textbooks a year from now

✓ Solution

Following our strategy for problems like these, do not jump into the choices before we have considered the meaning independently. T represents the number of textbooks at the end of the year, and L represents the number of laptops at the end of the year. If we add these together, we would get the sum of the textbooks and laptops the teacher has at the end of the year.

$$T + L = \text{Total number of textbooks and laptops}$$

This total is 60 in the problem. So, we can check out the choices and see that choice **(B)**, “The combined total number of laptops and textbooks at the end of the year in the teacher's classroom,” corresponds to this idea.

▸ Example 2

The height of water in inches, h , in a classroom's fish tank after w weeks is given by the function below.

$$h(w) = -\frac{1}{2}w + 25$$

Over a three-week period, by how much does the height of water in the tank change?

- (A) Increases by .5 inches
- (B) Increases by 25 inches
- (C) Decreases by 1.5 inches
- (D) Decreases by 2.5 inches

✓ Solution

To answer this, we must first understand the meaning of the numbers in the function before diving into the choices. The function is written in slope-intercept form. The y -intercept is 25, indicating the initial height of water in the tank before any weeks have gone by. The slope is $-\frac{1}{2}$, indicating that each week that goes by, the height of the water in the tank will decrease by $\frac{1}{2}$ an inch.

So, over a three-week period, we can see by how much the height in the tank has changed by taking $-\frac{1}{2}$ and multiplying it by 3:

$$-\frac{1}{2} \times 3 = -\frac{3}{2} = -1.5$$

Therefore, the height in the tank after three weeks have passed will decrease by 1.5 inches, corresponding to choice (C).

Functions in Table Form

Most functions you will encounter will be in the form of an equation. Sometimes, however, the SAT will provide the values of the function in a table. Here is how you attack a problem formatted in this way:

► Example

The linear function f is defined by $f(x) = ax + b$, where a and b are constants. The values in the table below represent ordered pairs for the function:

x	$f(x)$
10	700
20	1200

What is the value of the constant b ?

Fill In _____

✓ Solution

The way to read the table is to understand that each row represents an ordered pair: (10, 700) and (20, 1,200). You can solve for the constant b by first calculating the value of the constant a , which corresponds to the slope of the line:

$$\frac{\text{Change in } y}{\text{Change in } x} = \frac{1,200 - 700}{20 - 10} = \frac{500}{10} = 50$$

Now we know that the function can be written as $f(x) = 50x + b$. Next, solve for b by plugging in an ordered pair—let's use (10, 700) since it is smaller.

$$\begin{aligned} f(x) &= 50x + b \rightarrow \\ 700 &= 50 \times 10 + b \rightarrow \\ 700 &= 500 + b \rightarrow b = 200 \end{aligned}$$

So, the value of the constant b is 200.

Practice Drill #1—Word Problems and Function Interpretation

(If timing, take about 12 minutes to complete.)

1. The total number of pages in a book is T . Eloise will read P pages each day for exactly D days until she completes the book at the end of the final day. Which of the following expresses the relationship between these values?
 - (A) $T = PD$
 - (B) $T = \frac{P}{D}$
 - (C) $T = P + D$
 - (D) $T = P - D$
2. Mary rented a boat that cost a \$100 flat fee plus \$3 for each gallon of gasoline used. If Mary paid a total of \$130 to rent the boat, how many gallons of gasoline did she use?
 - (A) 10
 - (B) 15
 - (C) 30
 - (D) 45
3. An average pace for a backpacker on a certain trail is to hike 10 miles per day. If Joseph is taking a weeklong backpacking trip in which he wants his average pace over the entire week to exceed this average pace each day, which inequality represents the number of miles, m , he will travel on his trip?
 - (A) $m > 10$
 - (B) $m < 10$
 - (C) $m < 70$
 - (D) $m > 70$
4. A bread recipe calls for 6 eggs for every 10 cups of flour. If Martin wants to use a total of 15 eggs, how many cups of flour will he need to make this larger amount of bread using this recipe?

- (A) 15
- (B) 16
- (C) 25
- (D) 60

5. The number of windmills at a windfarm starts at 200, with 6 new windmills added each year and 2 mills removed each year due to wear and tear. What function represents the number of windmills, w , on the windfarm t years after the windfarm opens?

- (A) $w(t) = 200 + 6t$
- (B) $w(t) = 200 + 4t$
- (C) $w(t) = 6 + 200t$
- (D) $w(t) = 200 - 4t$

6. A catalog weighs enough that it requires 4 stamps for the post office to mail it. If a business is sending 500 catalogs, and each book of stamps has 20 stamps in it, how many books of stamps would the business need to purchase to mail all the catalogs?

- (A) 24
- (B) 80
- (C) 100
- (D) 2,000

7. Each student on a school trip packs 2 suitcases, 1 backpack, and 1 personal object. If there are 65 students on the trip, how many total items would the students pack?

- (A) 69
- (B) 130
- (C) 196
- (D) 260

8. The cost in dollars, C , of installing a sewer pipe that is L feet long is modeled by the function below:

$$C(L) = 300 + 20L$$

Given that function, what is the most logical interpretation of the following equation?

$$C(20) = 700$$

- (A) The cost to install a 700-foot sewer pipe is 20 dollars.
 - (B) 20 times the cost of a typical pipe is equivalent to 700 dollars.
 - (C) The cost to install a 20-foot-long sewer pipe is 700 dollars.
 - (D) 20 typical sewer pipes have a total installation cost of 700 dollars.
9. A plumber's compensation is \$50 per hour plus a \$5,000 profit-share at the end of the year. Which inequality represents the number of hours, n , she will need to work in order to make at least \$50,000 total compensation for the year?
- (A) $50,000 \leq 50n + 5,000$
 - (B) $50,000 \geq 50n + 5,000$
 - (C) $\frac{n}{50} \geq 5,000$
 - (D) $\frac{n}{50} \leq 5,000$
10. The height in feet of an airplane, A , and a balloon, B , are modeled by these two equations, in which t is the number of minutes after 12:00 P.M.

$$A = 10,000 - 180t$$

$$B = 20t$$

At what time that same day would the airplane and the balloon be at the same height?

- (A) 12:30 P.M.
- (B) 12:50 P.M.
- (C) 1:00 P.M.

(D) 1:45 P.M.

Solutions

1. (A) Since she will read P pages each day for D days, multiply P and D together to get the total number of pages read:

$$T = PD$$

2. (A) Using x as the number of gallons of gasoline used, set up an equation modeling the situation like this:

$$130 = 100 + 3x$$

This means that the \$100 flat fee plus \$3 times each gallon of gas used will equal a total amount of \$130. Then, solve for x :

$$130 = 100 + 3x \rightarrow$$

$$30 = 3x \rightarrow$$

$$x = 10$$

So, 10 gallons of gas were used.

3. (D) If Joseph exceeds the average pace of 10 miles per day over the 7-day period, he will travel in excess of $10 \times 7 = 70$ miles all together. Express this as an inequality by making the number of miles, m , be greater than 70: $m > 70$.
4. (C) Set up a proportion to solve this. There are 6 eggs for every 10 cups of flour, and this ratio needs to equal the ratio when there are 15 eggs (put the flour in the numerator since you are solving for flour, making you have to use fewer steps):

$$\frac{\text{Flour}}{\text{Eggs}} = \frac{10}{6} = \frac{x}{15} \rightarrow \text{Cross multiply to solve for } x \rightarrow$$

$$\frac{10}{6} \times 15 = x \rightarrow x = 25$$

5. **(B)** Since the number of windmills begins at 200, this number can be a constant. Each year, a net of 4 windmills are added to the windfarm, since 6 are added and 2 taken away. Therefore, the function that portrays the situation is:

$$w(t) = 200 + 4t$$

6. **(C)** The business will need to purchase a total of 4 stamps for each of 500 catalogs, so to get the total number of stamps needed, multiply 4 and 500 together:

$$4 \times 500 = 2,000$$

Then, calculate the number of stamp books needed by taking the total of 2,000 stamps and dividing it by the number of stamps in each stamp book, 20:

$$\frac{2,000}{20} = 100$$

So, 100 books of stamps would be needed.

7. **(D)** Each student packs a total of $2 + 1 + 1 = 4$ personal items. Therefore, simply multiply 4 by 65 to find the total items the students would pack:

$$65 \times 4 = 260$$

8. **(C)** Consider the original equation:

$$C(L) = 300 + 20L$$

Now, take a look at the other equation:

$$C(20) = 700$$

The 20 goes in the place of the variable L , which represents the length of the pipe. Therefore, the length of the pipe in consideration

is 20 feet. $C(L)$ represents the cost to install a pipe of length L , so 700 is the cost of installation for a pipe of 20 feet.

9. (A) The plumber's compensation is the sum of \$5,000 plus \$50 per each of n hours worked. This total compensation needs to be at least \$50,000, meaning the sum of the hourly wages and the profit sharing needs to be greater than or equal to 50,000. Multiply 50 by n to get the total from the hourly wages, and then add it to the \$5,000.

$50,000 \leq 50n + 5,000$ represents this situation.

10. (B) Set the two heights equal to each other to solve for the number of minutes after 12:00 P.M., t , at which they meet in the air:

$$A = 10,000 - 180t$$

$$B = 20t$$

Set them equal to each other and solve for t :

$$10,000 - 180t = 20t \rightarrow$$

$$10,000 = 200t \rightarrow$$

$$\frac{10,000}{200} = t \rightarrow$$

$$50 = t$$

So, take 50 minutes past 12:00 to get 12:50 P.M.

Practice Drill #2—Word Problems and Function Interpretation

(If timing, take about 12 minutes to complete.)

1. If a cat eats x cups of food per day, how many cups of food will the cat eat in y days?

(A) $x - y$

(B) $x + y$

(C) xy

(D) $\frac{x}{y}$

2. The relationship between distance, D , rate, R , and time, T , is modeled by the equation $D = RT$. If the rate increases but the distance remains the same, what must happen to the time?
- (A) It decreases.
(B) It increases.
(C) It remains constant.
(D) It cannot be determined.

3. The average price of a gallon of milk is modeled by the function C , in which y is the number of years after the year 2000.

$$C(y) = 2.00 + 0.08y$$

What does the number 0.08 in the function represent?

- (A) The number of gallons of milk sold
(B) The average yearly increase in price per gallon of milk
(C) The unit price for each gallon of milk
(D) The total number of gallons of milk sold in a given year
4. Out of the 50 states in the United States, all but 1, Nebraska, have bicameral legislatures—i.e., there are two legislative chambers. Nebraska has a unicameral legislature—i.e., there is just one legislative chamber. What fraction of the states in the United States are bicameral?
- (A) $\frac{1}{50}$
(B) $\frac{1}{25}$
(C) $\frac{24}{25}$
(D) $\frac{49}{50}$
5. Tabitha works as a cell phone salesperson. Her pay is \$10 per hour plus \$20 commission for each new cell phone she sells. If H

represents the number of hours she works in a given week and C represents the number of cell phones she sells that week, which equation represents her total salary (expressed in dollars before any deductions for taxes, etc.) for the week?

- (A) $Salary = 20H + 10C$
- (B) $Salary = 10H + 20C$
- (C) $Salary = 10H - 20C$
- (D) $Salary = 20H - 10C$

6. A movie theater concession counter sells a large popcorn for \$5 and a small popcorn for \$3. If the total number of both types of popcorn sold in a given day is 150, and the total revenue from the popcorn sales is \$570, how many small popcorns were sold? (Ignore sales tax in your calculations.)

- (A) 15
- (B) 30
- (C) 45
- (D) 90

7. The cost in dollars to operate a lemonade stand, C , is given by the function $c(x) = .25x + 20$, in which x represents the number of cups of lemonade sold. What does the number 20 represent in this situation?

- (A) The fixed cost to set up the lemonade stand
- (B) The cost per each cup of lemonade sold
- (C) The total number of cups of lemonade sold
- (D) The revenue from setting up the lemonade stand

8. The linear function $f(x) = kx + b$ has constants k and b . What is the y -intercept of the function based on the values of x and $f(x)$ in the table below?

x	$f(x)$
16	-28

21	-38
----	-----

- (A) 2
- (B) 4
- (C) 6
- (D) 10

9. John has \$20 to spend on his school lunch each week. A meal costs \$3 and a milk costs \$0.50. If he purchases one meal each day on Monday through Friday, what is the greatest number of milks he could purchase that week given his budget (note that sales tax is not applied to his purchases)?

- (A) 3
- (B) 7
- (C) 10
- (D) 20

10. In store A, 3 out of every 4 items are sold at a discount. In store B, 1 out of every 3 items is sold at a discount. If each store has 240 total items it is selling (both full price and at a discount), how many more discounted items will there be in store A than in store B?

- (A) 80
- (B) 100
- (C) 120
- (D) 480

Solutions

1. (C) Take the x cups of food and multiply it by the y days the cat eats it:

$$x \times y = xy$$

2. **(A)** Take the original expression and isolate the time variable, T , to better understand what would happen:

$$D = RT \rightarrow \frac{D}{R} = T$$

So, if the rate increases while the distance remains the same, the fraction will decrease because the denominator will increase.

Therefore, the time will decrease.

3. **(B)** In the function $C(y) = 2.00 + 0.08y$, C represents the price of the gallon of milk, and y is the number of years after 2000. So, 2.00 would be the price of the milk in the year 2000, and each year after 2000, the price of a gallon of milk would increase by 8 cents. Thus, the number 0.08 represents the average yearly increase in the price per gallon of milk.

4. **(D)** Since there is just 1 state, Nebraska, that does *not* have a bicameral legislature, there are 49 states that *do* have a bicameral legislature. To find the fraction, divide the number of states with a bicameral legislature, 49, by the total of 50 states:

$$\frac{49}{50}$$

5. **(B)** Tabitha makes \$10 for each of the H hours a week she works and \$20 for each of the C cell phones she sells in a week. Put this together to find her total salary for the week:

$$\text{Salary} = 10H + 20C$$

6. **(D)** Set up a series of equations to solve for the number of small popcorns sold. First, the sum of the large popcorns, which we can label L , and the small popcorns, which we can label S , is 150. In equation form, it is:

$$L + S = 150$$

The total revenue from the popcorn sales, \$570, is equivalent to what we get when multiplying 5 by the number of large popcorns and 3 by the number of small popcorns:

$$5L + 3S = 570$$

Now, use substitution to solve for the number of small popcorns:

$$L + S = 150 \rightarrow L = 150 - S$$

Plug this in to the second equation:

$$\begin{aligned} 5L + 3S &= 570 \rightarrow \\ 5(150 - S) + 3S &= 570 \rightarrow \\ 750 - 5S + 3S &= 570 \rightarrow \\ -2S &= -180 \rightarrow \\ S &= 90 \end{aligned}$$

So, 90 small popcorns were sold.

This problem can also be solved using elimination. Take the two equations $L + S = 150$ and $5L + 3S = 570$. Since we are solving for S , eliminate the L by multiplying $L + S = 150$ by -5 and adding this to the other equation:

$$\begin{array}{r} -5L - 5S = -750 \\ +5L + 3S = 570 \\ \hline 0 - 2S = -180 \rightarrow S = 90 \end{array}$$

7. **(A)** In the function $C(x) = .25x + 20$, if zero cups of lemonade were sold, there would still be a cost of \$20 to operate the stand. Since this cost is fixed, no matter how many cups of lemonade are sold, the \$20 would be the cost to set up the lemonade stand.
8. **(B)** Since the function is a line, you can start by solving for the slope of the line using the ordered pairs presented in the table: (16, -28) and (21, -38).

$$\frac{\text{Change in } y}{\text{Change in } x} = \frac{-38 - (-28)}{21 - 16} = \frac{-10}{5} = -2$$

Since the function, $f(x) = kx + b$, is already in slope-intercept form, we now know that -2 is the slope and can be plugged in for the constant k :

$$f(x) = kx + b \rightarrow$$

$$f(x) = -2x + b$$

Now, we can solve for the constant b , which corresponds to the y -intercept of the function. Do so by plugging in an ordered pair for x and $f(x)$. Let us use $(16, -28)$ since it is smaller:

$$f(x) = -2x + b \rightarrow$$

$$-28 = -2(16) + b \rightarrow$$

$$-28 = -32 + b \rightarrow$$

$$4 = b$$

Therefore, the y -intercept of the function is 4.

9. **(C)** If John purchases 1 meal each day on Monday through Friday, he will purchase a total of 5 meals. The cost for 5 meals is:

$$5 \times 3 = 15$$

He then has $20 - 15 = 5$ dollars remaining to purchase milks. Take the \$5 and divide it by \$0.50 to see the maximum number of milks he could purchase:

$$\frac{5}{0.50} = 10$$

Thus, John can purchase a maximum of 10 milks that week given his budget.

10. **(B)** Since there are 240 items in store A, find out how many items are being sold at a discount by multiplying $\frac{3}{4}$ by the total number of

items:

$$\frac{3}{4} \times 240 = 180$$

For the discounted items in store B, do a similar calculation:

$$\frac{1}{3} \times 240 = 80$$

Then, find the difference in the number of discounted items for each store by subtracting:

$$180 - 80 = 100$$

Practice Drill #3—Word Problems and Function Interpretation

(If timing, take about 12 minutes to complete.)

1. If $2x + k = 2(x + 3)$, what is the value of the constant k ?
 - (A) 2
 - (B) 3
 - (C) 5
 - (D) 6
2. The price of a painting, p , is modeled by the equation $p = 800 + 20y$, in which y is the number of years after the painting was created. What is the most logical interpretation of the number 20 in the equation?
 - (A) The price of the painting in y years
 - (B) The initial price of the painting
 - (C) The yearly increase in the painting's price
 - (D) The change in the painting's price over a 20-year period
3. Rental of a video game costs a flat fee of \$20 plus \$3 for each hour the video game is used. Which equation provides the total cost, C , of using the game for H hours?

- (A) $C(H) = 3H - 20$
- (B) $C(H) = H + 60$
- (C) $C(H) = 3H + 20$
- (D) $C(H) = 20H + 3$

x	y
6	0
4	$-\frac{2}{3}$
2	$-\frac{4}{3}$
0	-2
-2	$-\frac{8}{3}$

4. The table above provides pairs of values for x and y . Which equation below correctly shows the linear relationship between these values?

- (A) $y = \frac{1}{3}x - 2$
- (B) $y = \frac{2}{3}x - 1$
- (C) $y = \frac{1}{2}x - 5$
- (D) $y = \frac{1}{4}x$

5. A baker sells cupcakes for \$3 each and cookies for \$2 each. If he sells a total of 200 cookies and cupcakes and the total amount of revenue from selling the cookies and cupcakes is \$460, which set of equations could be used to solve for x cupcakes sold and y cookies sold?

- (A) $x + y = 460$ and $2x + 3y = 200$
- (B) $x + y = 200$ and $3x + 2y = 460$
- (C) $3x + 2y = 200$ and $x + y = 460$
- (D) $x \times y = 200$ and $(3x) \times (2y) = 460$

6. A discount bookstore sells books for \$6 each and magazines for \$3 each. In a given week, the store sells a combined total of 750

books/magazines and makes a total of \$3,600 from the book and magazine sales. In that week, how many magazines were sold?

- (A) 300
- (B) 450
- (C) 900
- (D) 10,800

7. A house is initially purchased for \$150,000 and increases in value by \$3,500 each year. Which of these expressions gives the price, P , of the house t years after purchase?

- (A) $P = 3,500 + 150,000t$
- (B) $P = 3,500t - 150,000$
- (C) $P = 150,000 + 3,500t$
- (D) $P = 150,000 - 3,500t$

8. In the following equation, $3x + 5 = 3x + k$, what must be true about the constant k equal in order for there to be no real solutions for x ?

- (A) $k = 3$
- (B) $k = 5$
- (C) $k \neq 3$
- (D) $k \neq 5$

9. In an art class, a bin contains C crayons and M markers. If there are twice as many markers as crayons, and the total number of markers and crayons in the bin is 90, which of these sets of equations could be used to solve for C and M ?

- (A) $C \times M = 90$
 $M = \frac{C}{2}$
- (B) $C \times M = 90$
 $M = \frac{C}{2}$

(C) $\frac{C}{M} = 90$

$2M = C$

(D) $C \times M = 2C$
 $M - 2C = 90$

10. Chris took a bike ride through the hills near his home. On his ride, he either went uphill or downhill. His total ride was 30 miles and took 1.6 hours. If half of the distance of his journey was uphill and the other half of the distance was downhill, and his downhill speed was an average of 25 mph, what was his average uphill speed?

- (A) 10 mph
(B) 12 mph
(C) 15 mph
(D) 18 mph

Solutions

1. (D) Simplify the expression so that the k is isolated to see its value:

$$2x + k = 2(x + 3) \rightarrow$$

$$2x + k = 2x + 6 \rightarrow$$

Subtract the $2x$ from both sides $\rightarrow$

$$k = 6$$

2. (C) The price of the painting is found with the equation $p = 800 + 20y$. At the year of the painting's creation, y equals zero and p will be 800. After one year, the price of the painting will increase by 20. So, the 20 represents the yearly increase in the painting's price.
3. (C) There is a flat fee of \$20, so no matter how many hours the video game is rented, there will be a constant \$20 fee. Then, for each hour the game is rented, there is a charge of \$3. The total cost is found by adding the flat fee of \$20 to the cost of \$3 for each hour it is rented:

$$C(H) = 3H + 20$$

4. **(A)** Save yourself time on this question by recognizing that all the answer choices are written in slope-intercept form, and have different y -intercepts. Fortunately, we can determine the y -intercept of the function by looking at the table: when the x value is 0, the y value is -2 .

Therefore, the only plausible option is choice (A): $y = \frac{1}{3}x - 2$.

5. **(B)** The total number of cupcakes sold is 200, so this equation fits the problem:

$$x + y = 200$$

The total revenue is \$460, and each of the x cupcakes sells for \$3 each, and each of the y cupcakes sells for \$2 each. Therefore, this equation fits the situation:

$$3x + 2y = 460$$

6. **(A)** Let's use the variable B for books and M for magazines and create equations to model what is described. First, there are a total of 750 books and magazines sold:

$$B + M = 750$$

Next, the total revenue from selling books at \$6 each and magazines at \$3 each is \$3,600:

$$6B + 3M = 3,600$$

Now, we can use elimination to solve for the magazines sold. Take the first equation and multiply it by -6 so that the B term can be eliminated, then add it to the second equation:

$$\begin{array}{r}
 -6B - 6M = -4,500 \\
 + 6B + 3M = 3,600 \\
 \hline
 0 - 3M = -900
 \end{array}$$

Then, solve for the number of magazines:

$$\begin{array}{r}
 -3M = -900 \rightarrow \\
 M = 300
 \end{array}$$

This can also be solved using substitution. Take the two equations $B + M = 750$ and $6B + 3M = 3,600$. Since we want M , substitute for B so everything is in terms of M :

$$\begin{array}{r}
 B + M = 750 \rightarrow \\
 B = 750 - M
 \end{array}$$

Plug this in for B into the other equation:

$$\begin{array}{r}
 6B + 3M = 3,600 \rightarrow \\
 6(750 - M) + 3M = 3,600 \rightarrow \\
 4,500 - 6M + 3M = 3,600 \rightarrow \\
 -3M = -900 \rightarrow \\
 M = 300
 \end{array}$$

7. **(C)** The price starts at 150,000 (i.e., when the years are zero), and each year it goes up by \$3,500. So, the y -intercept of the function is 150,000, and the slope (yearly change) of the function is 3,500. Putting this in slope-intercept form, $P = 150,000 + 3,500t$ is correct even though the y -intercept comes first in the expression.
8. **(D)** In order for there to be no solutions, the equation must result in something that is not true for any value of x . If we simplify the equation, we can see that if k is 5, there will be infinitely many solutions:

$$3x + 5 = 3x + k \rightarrow$$

Subtract $3x$ from both sides $\rightarrow$

$$5 = k$$

So, if $k \neq 5$, there would not be any solutions.

9. **(A)** The total number of markers and crayons in the class is 90, which can be represented by this equation:

$$C + M = 90$$

For the next equation, be careful to not just read it left to right. The correct representation of the phrase “there are twice as many markers as crayons” is:

$$M = 2C$$

Plug in a sample for M and a sample for C to see that this makes sense. If M is 40 and C is 20 then $M = 2C$. These two equations together correspond to choice **(A)**.

10. **(C)** Since half of the distance of the journey is uphill and the other downhill, 15 miles would be uphill, and 15 downhill. Let us first find how long it took to make the downhill journey—this portion would be at 25 mph. Plug it into the equation $D = RT$ and solve for time.

$$\begin{aligned} D &= RT \rightarrow \\ 15 &= 25 \times T \rightarrow \\ \frac{15}{25} &= .6 = T \end{aligned}$$

Now that we know that .6 of an hour was spent going downhill, we know that $1.6 - .6 = 1$ hour was spent going uphill. Since this part of the journey is 15 miles, the average uphill speed will simply be 15 miles per hour.

Algebra—Lines and Slope

Slope Formula

The slope of a line represents its vertical increase, *rise*, divided by the horizontal increase, *run*. Calculate the slope between two points, (x_1, y_1) and (x_2, y_2) , by plugging the coordinates of the points into this formula:

$$\text{Slope} = \frac{\text{Change in } y}{\text{Change in } x} = \frac{(y_2 - y_1)}{(x_2 - x_1)}$$

► Example

What is the slope of a line that has the points $(8, 3)$ and $(5, 1)$?

✓ Solution

Be consistent in which point is point 2 and which point is point 1. In this case, let's use $(8, 3)$ as point 2 and $(5, 1)$ as point 1—doing so will make for an easier calculation that does not involve negative values. So, $y_2 = 3$, $y_1 = 1$, $x_2 = 8$, and $x_1 = 5$.

$$\frac{(y_2 - y_1)}{(x_2 - x_1)} = \frac{(3 - 1)}{(8 - 5)} = \frac{2}{3}$$

Thus, the slope of this line would be $\frac{2}{3}$.

Practice

What is the slope of a line with the points $(4, 3)$ and $(6, 1)$?

What is the slope of a line with the points $(2.5, 7)$ and $(-4, -8)$?

Consider a line in the xy -coordinate plane in which to get from point A to point B , one must go up +5 units vertically and go over +3 units horizontally. What is the slope of this line?

Solutions

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{(3 - 1)}{(4 - 6)} = \frac{2}{-2} = -1$$

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{(7 - (-8))}{(2.5 - (-4))} = \frac{7 + 8}{2.5 + 4} = \frac{15}{6.5} \approx 2.31$$

The “rise” of the line is +5 units and the “run” of the line is +3 units. So, the slope is the rise divided by the run:

$$\frac{\text{Rise}}{\text{Run}} = \frac{\text{Change in } y}{\text{Change in } x} = \frac{5}{3}$$

Slope-Intercept Form of a Line

In order to graph a line, put its equation in **slope-intercept** form:

$$y = mx + b$$

m = slope of the line, the “rise” over the “run”

b = y -intercept of the line, i.e., where the line intersects the y -axis

➤ Example 1

What is the slope and y -intercept of a line with the equation $y = 5x - 7$?

✓ Solution

The equation is already in slope-intercept form, so just match up the numbers in the equation to their corresponding values.

$$y = mx + b$$

$$y = 5x - 7$$

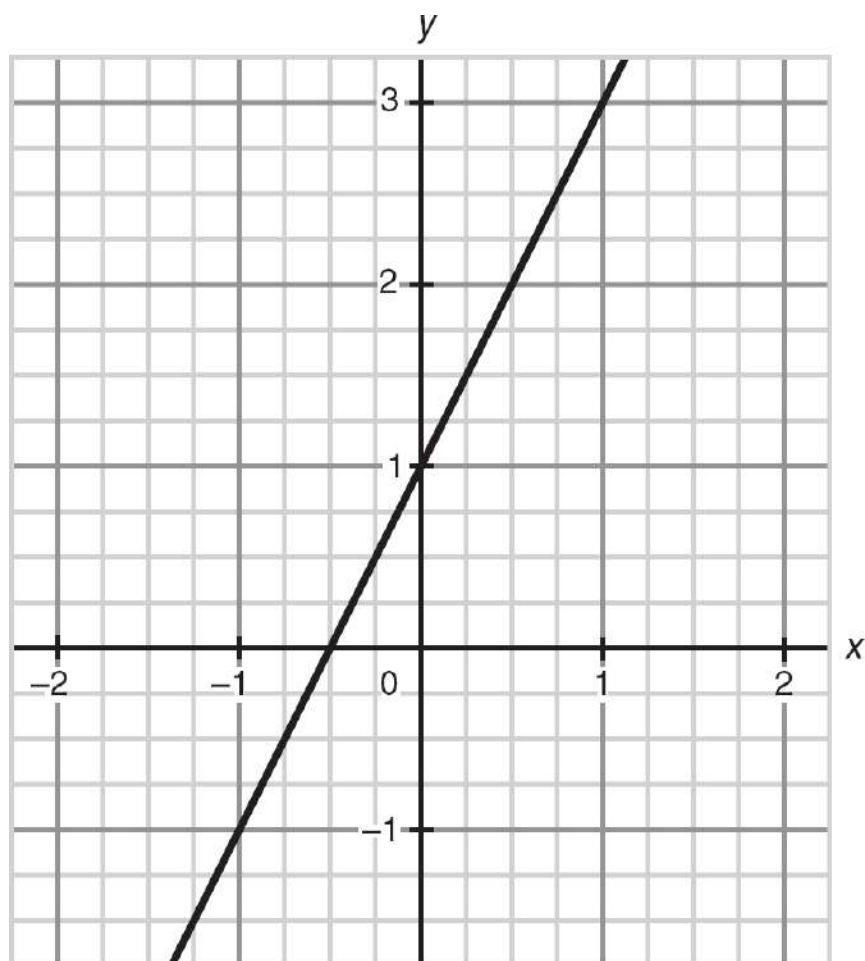
$$m = 5$$

$$b = -7$$

So, the slope of this line is 5, and the y -intercept of the line is -7 .

➤ Example 2

What is the equation of the line with the graph below?



✓ Solution

The line intersects the y -axis at $(0, 1)$, making this point the y -intercept. The line “rises” 2 units for every 1 unit it “runs,” giving a slope of 2. So, the equation for the line is:

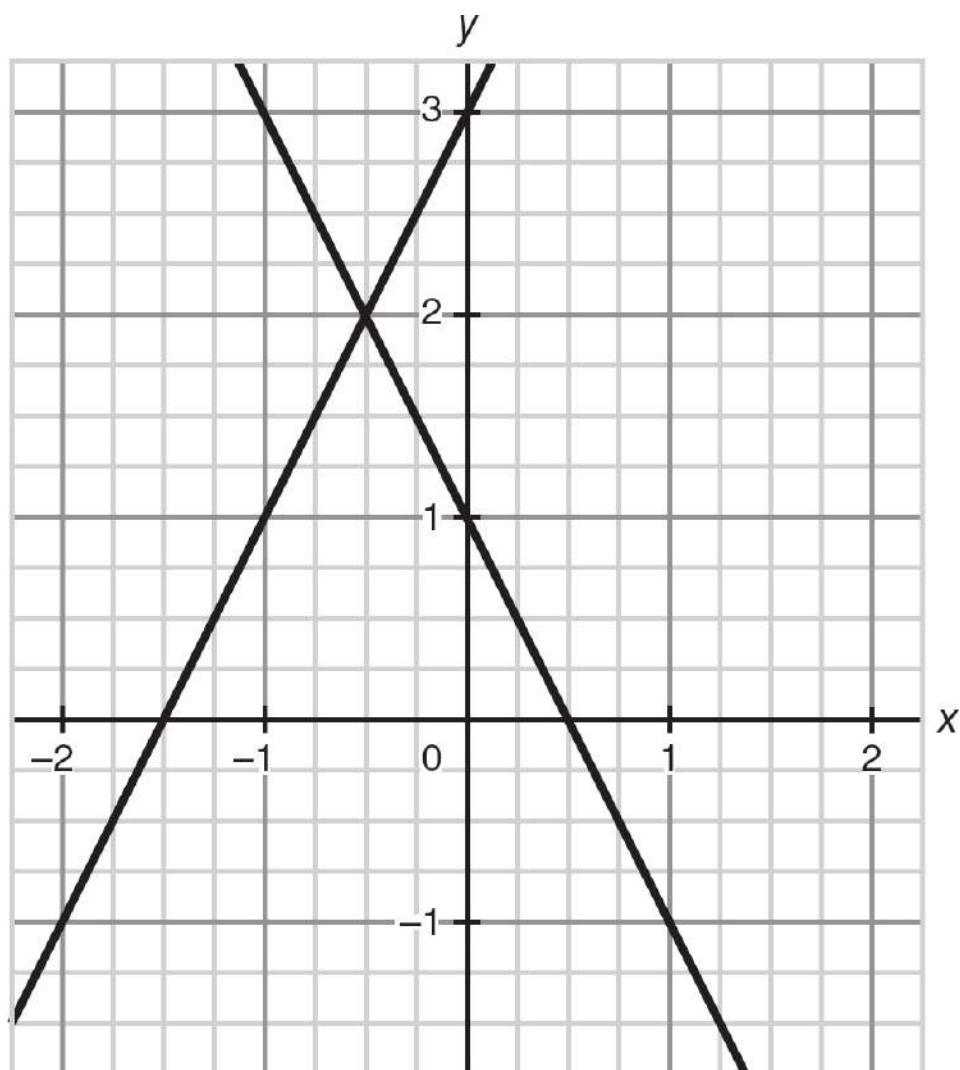
$$y = 2x + 1$$

Overlapping and Intersecting Lines

Lines that have *equivalent* equations, although in different forms, will *overlap* one another. For example, $y = 3x + 4$ and $2y = 6x + 8$ overlap since the second equation is simply two times the first equation.

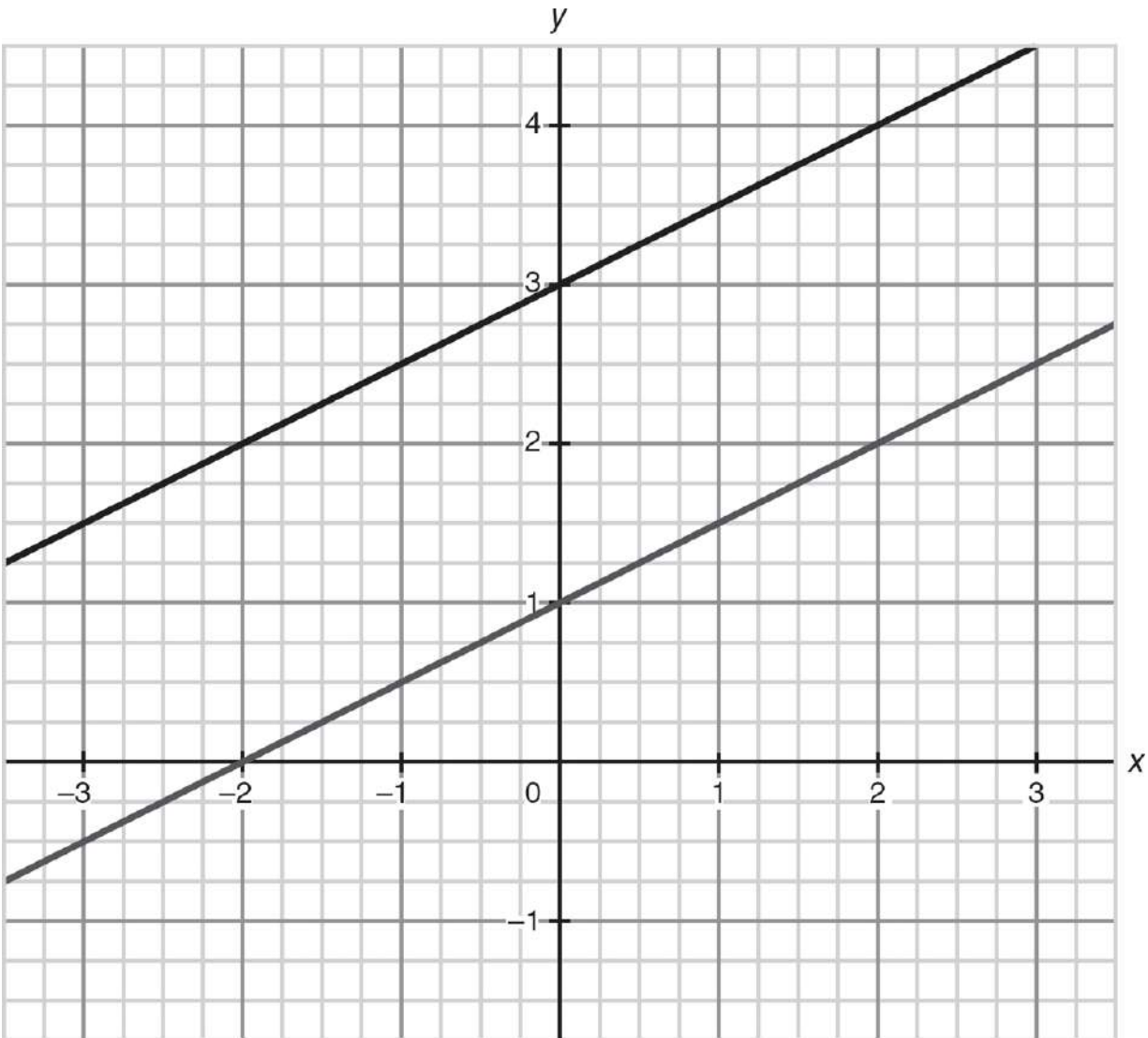
Lines that *meet at a single point intersect* one another. For example, $y = 2x + 3$ and $y = -2x + 1$ will intersect in the xy -coordinate plane when

graphed:



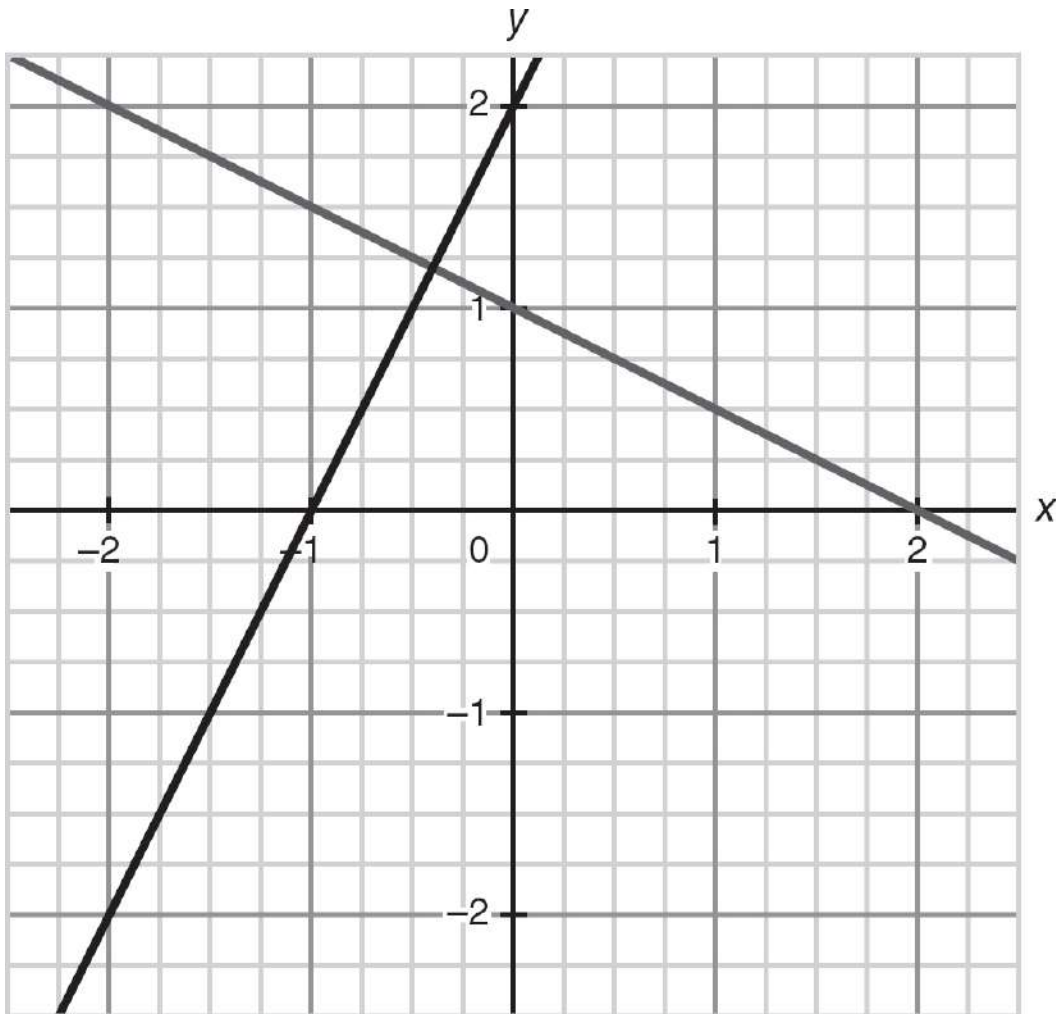
Parallel and Perpendicular Lines

Lines that are *parallel* to one another will have the *same slope*, but different *y*-intercepts—they will never intersect or overlap one another. For example, the lines with the equations $y = \frac{1}{2}x + 1$ and $y = \frac{1}{2}x + 3$ are parallel to one another:



Perpendicular lines intersect at a right angle (90 degrees) and have slopes that are *negative reciprocals* of one another (i.e., you flip the fraction and change the sign.) For example, if one line has a slope of 3, the line perpendicular to it will have a slope of $-\frac{1}{3}$. Consider two perpendicular lines: $y = -\frac{1}{2}x + 1$ and $y = 2x + 2$.

Their graph in the xy -coordinate plane would be as follows:



Practice

What is the slope of a line with the equation $y = -3x + 8$?

What is the y -intercept of a line with the equation $y = 2x + 5$?

What is the slope of a line with the equation $2y = 3x + 4$?

What is the y -intercept of a line with the equation $y - 3 = 2x + 1$?

If the slope of a line is 4, what is the slope of a line parallel to it?

If a line has the equation $y = 5x - 4$, what is the slope of a line perpendicular to it?

Would the following sets of lines *overlap*, *intersect*, be *parallel*, or be *perpendicular* to each other?

(A) $y = 2x + 9$ and $y = 2x - 4$

(B) $\frac{1}{3}y = \frac{1}{3}x - 1$ and $y = x - 3$

- (C) $y = 2x$ and $y = -\frac{1}{2}x - 2$
 (D) $y = 4x - 1$ and $y = 3x + 2$

Solutions

-3.

5.

Divide both sides of the equation by 2 to put it in slope-intercept form.

$$2y = 3x + 4 \rightarrow \frac{2y}{2} = \frac{3x + 4}{2} \rightarrow y = \frac{3}{2}x + 2$$

Now that it is in slope-intercept form, find the slope: $\frac{3}{2}$.

Put the equation in slope-intercept form to determine the y-intercept.

$$y - 3 = 2x + 1 \rightarrow y = 2x + 1 + 3 = y = 2x + 4$$

Now that it is in slope-intercept form, you can see that the y-intercept is 4.

Parallel lines have the same slopes as one another, so it would just be 4.

The current line has a slope of 5, so take the negative reciprocal of 5:

$$5 \rightarrow -\frac{1}{5}$$

Keep in mind that the negative reciprocals have a product of -1 .

7A. These lines have the same slope and different y-intercepts, so they are *parallel*.

7B. The first equation can be simplified to look like the second equation:

$$\frac{1}{3}y = \frac{1}{3}x - 1 \rightarrow 3\left(\frac{1}{3}y\right) = 3\left(\frac{1}{3}x - 1\right) \rightarrow y = x - 3$$

Since the lines have equivalent equations, they *overlap*.

7C. The product of the slopes of the two lines is -1 .

$$2 \times \left(-\frac{1}{2}\right) = -1$$

Therefore, they are *perpendicular* to each other.

- 7D. The two lines have different slopes and different y -intercepts. They will *intersect* each other in the xy -coordinate plane.

SAT Math Strategy

Memorize the key slope and line formulas so you can avoid being intimidated.

SAT Math questions using the above concepts will often integrate multiple ideas about slope and lines. If you know the formulas well, you can write out what you need to think through the problem.

► Example 1

If $ax + by = 5$ is a line in the xy -coordinate plane in which a and b are constants, which of the following expresses the slope of the line?

- (A) a
- (B) $-\frac{a}{b}$
- (C) $-\frac{b}{a}$
- (D) 5

✓ Solution

Do not let yourself be intimidated by the unusual formatting presented in the problem.

Remember the fundamental concept:

- Slope-intercept form is $y = mx + b$.

So, take the equation and put it in slope-intercept form to find the slope of the line:

$$ax + by = 5 \rightarrow by = -ax + 5 \rightarrow \frac{by}{b} = \frac{-ax + 5}{b} \rightarrow y = -\frac{a}{b}x + \frac{5}{b}$$

So, the correct answer is **(B)**, $-\frac{a}{b}$.

➤ Example 2

a	4	x	10	13
b	1	2	3	4

Given that the relationship between a and b is linear, what is the value of x in the table above?

Fill in: _____

✓ Solution

The information is presented in a table instead of the usual (x, y) style. Since the problem states that the relationship between a and b is linear, the *slope* of the line will be constant. We can treat a as we would normally treat x and treat b as we would normally treat y . If we find the slope of the line between two points, it will be the same as it would be for two different points on the line. Let's take the point $(13, 4)$ and $(10, 3)$ to see what the slope of the line would be:

$$\frac{(y_2 - y_1)}{(x_2 - x_1)} = \frac{(4 - 3)}{(13 - 10)} = \frac{1}{3}$$

We can then set up an equation to solve for the unknown value of x . The slope of $\frac{1}{3}$ will be the same if we pick a different set of points. So, let's pick $(4, 1)$ and $(x, 2)$ and set it equal to $\frac{1}{3}$ so that we can solve for x :

$$\frac{2 - 1}{x - 4} = \frac{1}{3} \rightarrow \frac{1}{x - 4} = \frac{1}{3} \rightarrow \text{Cross Multiply} \rightarrow 3 = x - 4 \rightarrow x = 7$$

Keep in mind that in a line, the y -value changes by the same amount with each unit increase in x ; so the the problem can be answered by inspection (just follow the pattern and add 3 to 4).

Practice Drill—Lines and Slope

(If timing, take about 12 minutes to complete.)

1. Which of the following equations represents a line in the xy -coordinate plane with a y -intercept of 6 and a slope of -3 ?

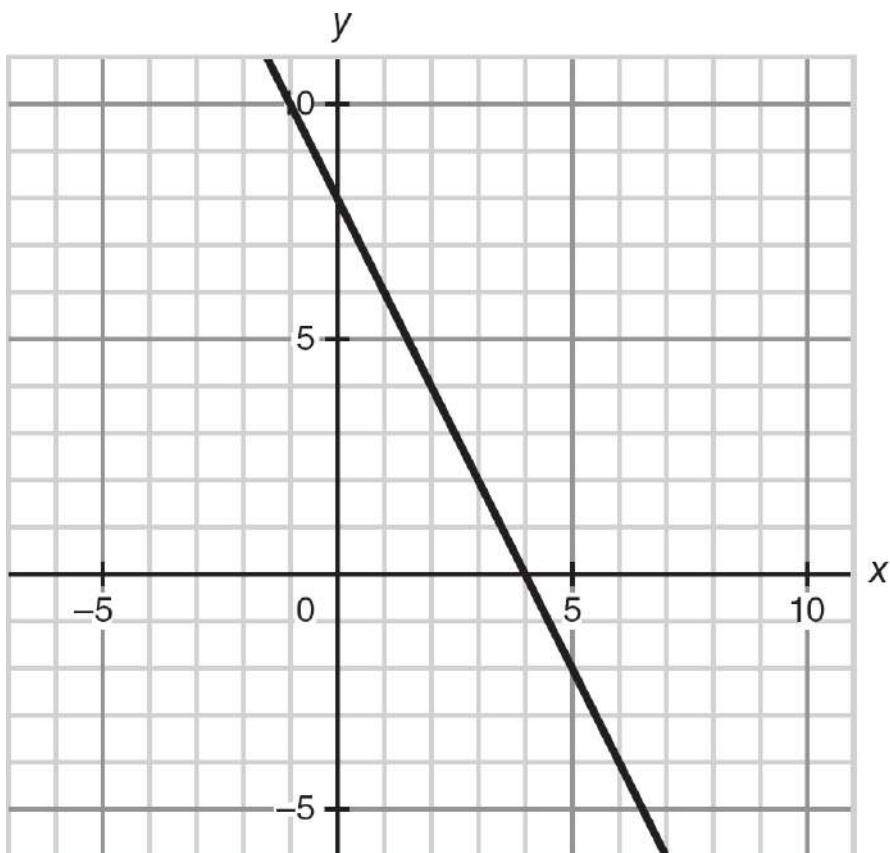
- (A) $y = 3x + 6$
- (B) $y = 6x - 3$
- (C) $y = 6x + 3$
- (D) $y = -3x + 6$

2. In the xy -plane, which of these linear equations has a y -intercept of 12?

- (A) $y = 4x + 12$
- (B) $12y = 4x - 1$
- (C) $y = 4x - 12$
- (D) $12 + y = 4x$

3. A linear equation in the xy -plane intercepts the y -axis at -3 . For every 2 units the y -coordinate of the line increases, the x -coordinate decreases by 7 units. Which of the following is the correct equation for this line?

- (A) $y = \frac{7}{2}x + 3$
- (B) $y = \frac{2}{7}x - 3$
- (C) $y = -\frac{2}{7}x - 3$
- (D) $y = \frac{3}{2}x - 7$



4. Consider the graph of the line above as graphed in the xy -coordinate plane. What is the value of b if the line is presented in the equation $y = mx + b$, in which both m and b are constants?
- (A) 4
(B) 8
(C) -2
(D) $-\frac{1}{2}$
5. What is the slope of a line with the equation $5x + 4y = 2$?
- (A) $-\frac{1}{2}$
(B) $\frac{4}{5}$
(C) $-\frac{5}{4}$
(D) 2

6. For the equation $\frac{1}{2}y = \frac{2}{3}x - 4$, what is the x -intercept?

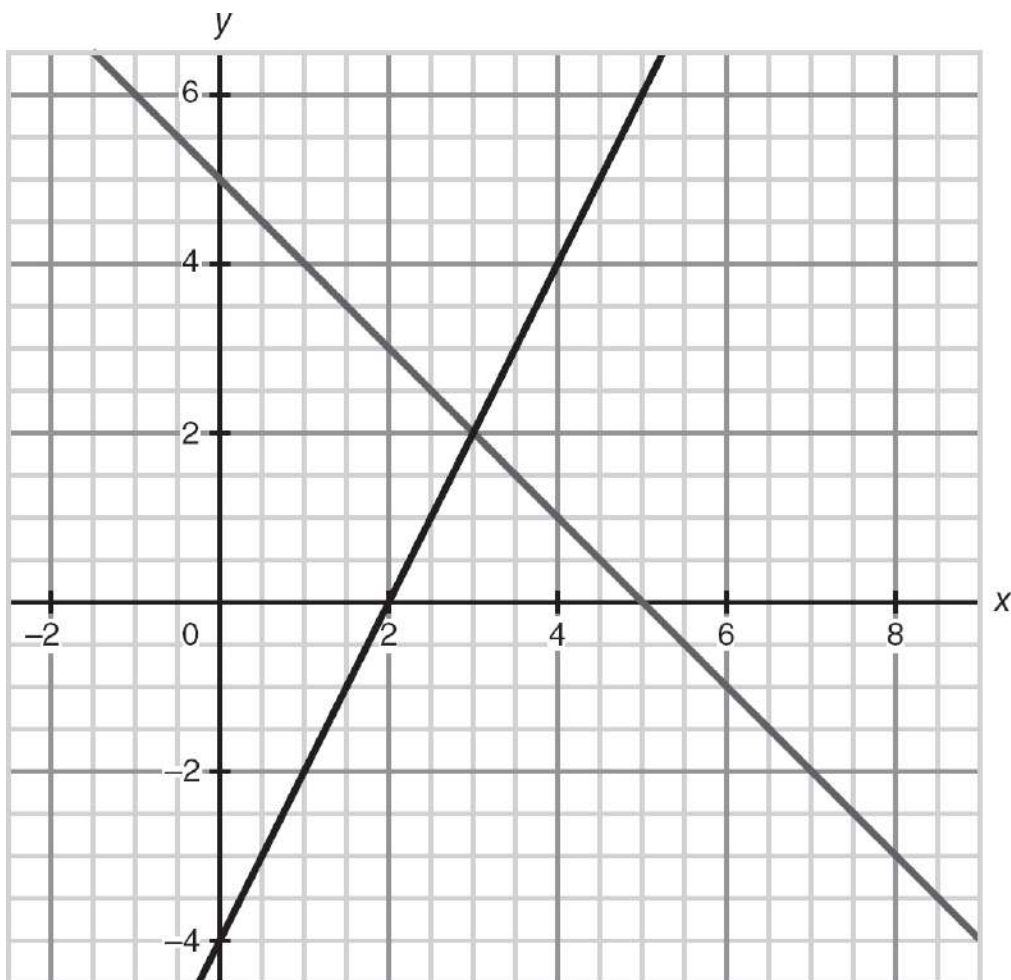
- (A) -8
- (B) $-\frac{4}{3}$
- (C) 3
- (D) 6

7. Two lines are graphed in the xy -plane. The lines have the same slope and different y -intercepts. How many solution(s) would the equations represented by this pair of lines have?

- (A) None
- (B) One
- (C) Two
- (D) Infinite

8. Which of these represents a linear equation in the xy -plane that has the points $(5, 17)$ and $(2, 5)$?

- (A) $y = -4x - 3$
- (B) $y = -3x + 4$
- (C) $y = 4x - 3$
- (D) $y = 3x + 4$



9. The above graph is represented by which of these sets of equations?

(A) $y = -4x + 2$
 $y = 5x + 1$

(B) $y = 2x - 4$
 $y = -x + 5$

(C) $y = \frac{1}{2}x - 4$
 $y = -5x + 1$

(D) $y = \frac{1}{4}x - 1$
 $y = -2x + 5$

10. Which of the following equations has a slope perpendicular to the slope of a line with the equation $y = ax + b$, given that a and b are constants?

(A) $y = -\frac{1}{a}x + 2b$

(B) $y = -ax + 2b$

(C) $y = -\frac{1}{b}x + 2a$

(D) $y = -bx - 2a$

Solutions

1. **(D)** Use the slope-intercept form of a line, and plug in the value for the slope, m , and the y -intercept, b .

$$y = mx + b \rightarrow y = -3x + 6$$

2. **(A)** When a line is written in slope-intercept form, the y -intercept corresponds to the constant b . The only option that has positive 12 for b is choice **(A)**.

$$y = mx + b \rightarrow y = 4x + 12$$

3. **(C)** From the description of the line in the problem, we can determine the line's slope. The line decreases horizontally 7 units for every 2 units it increases vertically. Therefore, the slope of the line will be $\frac{2}{(-7)} = -\frac{2}{7}$. The only option that has $-\frac{2}{7}$ for its slope is choice **(C)**.

4. **(B)** The line intersects the y -axis at the point $(0, 8)$. Therefore, the y -intercept of the line is 8.

5. **(C)** Put the line in slope-intercept form in order to determine the slope of the line:

$$\begin{aligned} 5x + 4y &= 2 \rightarrow \\ 4y &= -5x + 2 \rightarrow \\ y &= -\frac{5}{4}x + \frac{2}{4} \rightarrow y = -\frac{5}{4}x + \frac{1}{2} \end{aligned}$$

So, the slope of the line is $-\frac{5}{4}$.

6. **(D)** This is an easy question to misread—you are asked to find the x -intercept, not the y -intercept. The x -intercept is the point at which the line intersects the x -axis; for this to happen, the y value at the point must be zero. So, plug zero in for y and see what the value of x is:

$$\begin{aligned}\frac{1}{2}y &= \frac{2}{3}x - 4 \rightarrow \\ \frac{1}{2}(0) &= \frac{2}{3}x - 4 \rightarrow \\ 0 &= \frac{2}{3}x - 4 \rightarrow 4 = \frac{2}{3}x \rightarrow \\ x &= 4 \times \left(\frac{3}{2}\right) \rightarrow x = \frac{12}{2} = 6\end{aligned}$$

7. **(A)** Lines that have the same slope and different y -intercepts run parallel to one another. At no point will they intersect, so the answer is “none.”
8. **(C)** Looking ahead to the answers, all of the choices have different values for the line’s slope. So, calculate the slope of the line with the given information and see which of the options matches:

$$\text{Slope} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{17 - 5}{5 - 2} = \frac{12}{3} = 4$$

The only one of the lines that has 4 as its slope is choice **(C)**, $y = 4x - 3$.

9. **(B)** Fortunately, the different options given have different y -intercepts. So you can save time in solving this by identifying the y -intercepts of the two lines and then matching them with a choice. The two y -intercepts are 5 and -4 , and the only option that has both of those values as y -intercepts is choice **(B)**:

$$\begin{aligned}y &= 2x - 4 \\ y &= -x + 5\end{aligned}$$

10. **(A)** Since the equation of the line is already in slope-intercept form, we can see that its slope is a . We then can take the negative reciprocal

of a to get the slope of a line perpendicular to it:

$$a \rightarrow -\frac{1}{a}$$

The only option that has $-\frac{1}{a}$ as its slope is choice (A).

Advanced Math

This section contains comprehensive review and strategies for all of the concepts below:

Polynomials and Factoring

- Polynomial Manipulation
- Common Factoring Patterns

Exponents and Roots

- Exponent Rules
- Problems with Exponents and Roots

Solving Quadratic Equations

- Factoring Quadratic Equations
- Square Root Method
- Quadratic Formula
- Completing the Square
- Plugging in the Answers
- Undefined Functions
- Extraneous Solutions
- Synthetic Division

Zeros, Parabolas, and Polynomial Graphing

- Zeros of a Function
- Parabola Graphing

- Function Transformations
- Visualizing Polynomial Graphs

Function Interpretation and Manipulation

- Putting Variables in Terms of Other Variables
- Identifying Constants
- Interpreting Functions

Polynomials and Factoring

Polynomial Manipulation

The SAT Math section will have you simplify polynomial expressions using addition, subtraction, multiplication, and division. How should you approach these types of problems?

Students typically miss polynomial simplification problems not because of their mathematical difficulty, but because of careless mistakes, like with manipulating negative signs.

SAT Math Strategy

When simplifying polynomials, write out all your steps to avoid making careless errors.

► Example

$(-2x^2 + 3x + 1) - (x^2 + x + 2)$ is equivalent to which of these expressions?

- (A) $x^2 + 3x - 1$
- (B) $-x^2 + 3x + 1$
- (C) $-3x^2 + 2x - 1$
- (D) $-3x^2 - 2x - 1$

✓ Solution

Combine the x^2 components, the x components, and the numerical components in order to simplify. Write out all your steps to avoid careless errors.

$$(-2x^2 + 3x + 1) - (x^2 + x + 2)$$

Remove the parentheses, and distribute the -1 throughout the second half of the expression:

$$-2x^2 + 3x + 1 - x^2 - x - 2$$

Now, group like terms together to simplify:

$$(-2x^2 - x^2) + (3x - x) + (1 - 2) \rightarrow -3x^2 + 2x - 1$$

This corresponds to answer choice (C).

Practice

Simplify the following expressions.

$$2x + 6x - 9x$$

$$3x^2 - 4x^2$$

$$2x^2 - x + x^2$$

$$3x^3 - 2x + x^3 + 4x$$

$$3x^4 + 2(x^2 - 3x^4)$$

$$3(4x^2 - 2x) - 2(3x^2 + 5)$$

$$3(-x + 4) - 2x(x + 3)$$

Solutions

$$2x + 6x - 9x \rightarrow 8x - 9x \rightarrow -x$$

$$3x^2 - 4x^2 \rightarrow -x^2$$

$$2x^2 - x + x^2 \rightarrow (2x^2 + x^2) - x \rightarrow 3x^2 - x$$

$$3x^3 - 2x + x^3 + 4x \rightarrow$$

$$3x^3 + x^3 + (-2x + 4x) \rightarrow$$

$$4x^3 + 2x$$

$$3x^4 + 2(x^2 - 3x^4) \rightarrow$$

$$3x^4 + 2x^2 - 6x^4 \rightarrow$$

$$8x^4 - 6x^4 + 2x^2 \rightarrow$$

$$2x^4 + 2x^2$$

$$3(4x^2 - 2x) - 2(3x^2 + 5) \rightarrow$$

$$12x^2 - 6x - 6x^2 - 10 \rightarrow$$

$$12x^2 - 6x^2 - 6x - 10 \rightarrow$$

$$6x^2 - 6x - 10$$

$$(-x + 4) - 2x(x + 3) \rightarrow$$

$$-x^2 + 4x - 2x^2 - 6x \rightarrow$$

$$-x^2 - 2x^2 + (4x - 6x) \rightarrow$$

$$-3x^2 - 2x$$

Common Factoring Patterns

Since the SAT primarily evaluates your skill in problem solving and pattern recognition, as opposed to evaluating your skill in doing tedious calculations, memorize these common factoring patterns so that you can solve the problems most efficiently.

SAT Math Strategy

The SAT math consistently has problems in form that can be easily factored. Be on the lookout for common factoring patterns.

Square of Binomial (with Plus Sign)

$$(a + b)(a + b) = a^2 + 2ab + b^2$$

➤ Example

$$(x + 5)(x + 5) = x^2 + 10x + 25$$

Difference of Squares

$$(a + b)(a - b) = a^2 - b^2$$

► Example

$$(x + 5)(x - 5) = x^2 - 25$$

Square of Binomial (with Negative Sign)

$$(a - b)(a - b) = a^2 - 2ab + b^2$$

► Example

$$(x - 5)(x - 5) = x^2 - 10x + 25$$

Sum of Cubes

$$(a + b)(a^2 - ab + b^2) = a^3 + b^3$$

► Example

$$(x + 5)(x^2 - 5x + 25) = x^3 + 5^3 = x^3 + 125$$

Difference of Cubes

$$(a - b)(a^2 + ab + b^2) = a^3 - b^3$$

► Example

$$(x - 5)(x^2 + 5x + 25) = x^3 - 5^3 = x^3 - 125$$

Practice

Write the following expressions in factored form.

$$t^2 + 2n + 1 = ?$$

$$t^2 - 14a + 49 = ?$$

$$y^2 - 16 = ?$$

$$4x^2 - 9y^2 = ?$$

$$27 - n^3 = ?$$

$$9x^2 - 25y^2 = ?$$

$$\frac{1}{4}x^2 - \frac{1}{9}y^2 = ?$$

$$125a^3 + 64b^3 = ?$$

Solutions

$$t^2 + 2n + 1 = (n + 1)(n + 1)$$

$$t^2 - 14a + 49 = (a - 7)(a - 7)$$

$$y^2 - 16 = (y + 4)(y - 4)$$

$$4x^2 - 9y^2 = (2x)^2 - (3y)^2 = (2x + 3y)(2x - 3y)$$

$$27 - n^3 = \rightarrow$$

$$t^3 - b^3 = (a - b)(a^2 + ab + b^2) \rightarrow$$

$$27 - n^3 = (3 - n)(9 + 3n + n^2)$$

$$9x^2 - 25y^2 = (3x)^2 - (5y)^2 = (3x + 5y)(3x - 5y)$$

$$\frac{1}{4}x^2 - \frac{1}{9}y^2 = ?$$

$$\left(\frac{1}{2}x + \frac{1}{3}y\right)\left(\frac{1}{2}x - \frac{1}{3}y\right)$$

$$(a + b)(a^2 - ab + b^2) = a^3 + b^3$$

$$125a^3 + 64b^3 = (5a)^3 + (4b)^3 \rightarrow$$

$$t^3 + b^3 = (a + b)(a^2 - ab + b^2) \rightarrow$$

$$(5a + 4b)(25a^2 - 20ab + 16b^2)$$

Practice Drill—Polynomials and Factoring

(If timing, take about 12 minutes to complete.)

Which of the following is equivalent to $3n(n^2 + 2n - 1)$?

- A) $3n^3 + 6n^2 - 3n$
- B) $3n^2 + 6n - 3$
- C) $3n^3 + 6n^2 + 3n$
- D) $3n^6 + 6n^4 - 3n^2$

$$x^3 + 6x^2 + 9x$$

Which of the following is equivalent to the above expression?

- A) $x(x + 3)(x - 3)$
- B) $(x + 3)^3$
- C) $x(x + 3)^2$
- D) $(x + 3)(x + 3)$

$x^2 + 12x = -36$ is equivalent to which of the following?

- A) $(x + 6) = (x - 6)$
- B) $x(x + 12 + 36) = 0$
- C) $(x + 6)^2 = 0$
- D) $(x - 6)^2 = 4$

Which of the following expresses the result when $x^3 + x$ is subtracted from $5x^3 + 2x^2$?

- A) $2x^3 + 2x^2 - x$
- B) $4x^3 + 2x^2 + x$
- C) $-2x^3 - 2x^2 + x$
- D) $4x^3 + 2x^2 - x$

The expression $-(x^2 + 2)(-x - 1)$ is equivalent to which of the following?

- A) $x^3 - x^2 + 2x - 2$
- B) $x^3 + 2x^2 - x - 2$
- C) $x^3 + x^2 + 2x + 2$
- D) $-x^3 - x^2 + 2x + 1$

$$(x + y^2)(-x - y^2)$$

Which of the following options is an equivalent form of the expression above?

- A) $x^2 - 2x y^2 + y^4$
- B) $-x^2 - 2x y^2 - y^4$
- C) $2x^2 - x y^2 - 4y^4$
- D) $-x^2 - y^4$

$\frac{5}{3} + \frac{2}{x-3}$ is equivalent to which of the following, given that $x \neq 3$?

- A) $\frac{7}{3x}$
- B) $\frac{7}{3x-9}$
- C) $\frac{10}{3(x-3)}$
- D) $\frac{5x-9}{3x-9}$

Fill-In Practice: Write your answer in the underlined blank under each question.

If for the function $f(x) = (2x - 10)^2$, what is the value of $f(13)$?

Answer: _____

If $\frac{2x}{5} - \frac{3y}{10} = 0$, what is the value of $\frac{x}{y}$?

Answer: _____

If $\frac{3}{9 + 6x + x^2} = \frac{3}{4}$, what is the value of $(x + 3)$ if $(x + 3) > 0$?

Answer: _____

Solutions

1. (A)

$$3n(n^2 + 2n - 1) \rightarrow$$

Distribute the $3n \rightarrow$

$$3n^3 + 6n^2 - 3n$$

2. (C)

$$x^3 + 6x^2 + 9x \rightarrow$$

Factor out an $x \rightarrow$

$$x(x^2 + 6x + 9) \rightarrow$$

Factor the part in parentheses $\rightarrow$

$$x(x + 3)(x + 3) \rightarrow x(x + 3)^2$$

3. (C)

$$x^2 + 12x = -36 \rightarrow$$

$$x^2 + 12x + 36 = 0 \rightarrow$$

$$(x + 6)(x + 6) = 0 \rightarrow (x + 6)^2 = 0$$

4. (A) Be careful to put this in the correct order. It should look like this:

$$(3x^3 + 2x^2) - (x^3 + x) \rightarrow$$

$$3x^3 + 2x^2 - x^3 - x \rightarrow$$

$$2x^3 + 2x^2 - x$$

5. (C)

$$-(x^2 + 2)(-x - 1) \rightarrow$$

FOIL the parts within the parentheses $\rightarrow$

$$-(-x^3 - x^2 - 2x - 2) \rightarrow$$

Distribute the $-1 \rightarrow$

$$x^3 + x^2 + 2x + 2$$

6. (B)

$$(x + y^2)(-x - y^2) \rightarrow$$

FOIL the expression $\rightarrow$

$$-x^2 - xy^2 - xy^2 + y^4 \rightarrow$$

$$-x^2 - 2xy^2 - y^4$$

7. **(D)** Make each fraction have a common denominator and then add them together.

$$\frac{5}{3} + \frac{2}{x-3} \rightarrow$$

$$\frac{5(x-3)}{3(x-3)} + \frac{2(3)}{3(x-3)} \rightarrow$$

$$\frac{5(x-3) + 6}{3(x-3)} \rightarrow$$

$$\frac{5x - 15 + 6}{3(x-3)} \rightarrow$$

$$\frac{5x - 9}{3(x-3)} \rightarrow$$

$$\frac{5x - 9}{3x - 9}$$

8. **(256)**

$$f(x) = (2x - 10)^2 \rightarrow$$

$$f(13) = (2(13) - 10)^2 \rightarrow$$

$$f(13) = (26 - 10)^2 \rightarrow$$

$$f(13) = 16^2 = 256$$

9. **($\frac{3}{4}$ or 0.75)**

$$\frac{2x}{5} - \frac{3y}{10} = 0 \rightarrow$$

$$\frac{2x}{5} = \frac{3y}{10} \rightarrow$$

Divide both sides by $y \rightarrow$

$$\frac{2x}{5y} = \frac{3}{10} \rightarrow$$

Multiply both sides by $\frac{5}{2} \rightarrow$

$$\frac{x}{y} = \frac{3}{10} \times \frac{5}{2} = \frac{15}{20} = \frac{3}{4}$$

10. **(2)** Recognize that the denominator is the square of $(x + 3)$, and this will be much easier to solve:

$$\frac{3}{9 + 6x + x^2} = \frac{3}{4} \rightarrow$$

$$\frac{3}{(x + 3)(x + 3)} = \frac{3}{4} \rightarrow$$

$$\frac{3}{(x + 3)^2} = \frac{3}{4} \rightarrow$$

Divide both sides by 3 $\rightarrow$

$$\frac{1}{(x + 3)^2} = \frac{1}{4} \rightarrow$$

Cross multiply to bring the values to the numerator $\rightarrow$

$$4 = (x + 3)^2 \rightarrow$$

Take the square root of both sides $\rightarrow$

$$2 = x + 3$$

Fortunately, we don't need to worry about imaginary solutions since the value of $(x + 3)$ is greater than zero.

If you do not see the pattern, you can also solve this by finding the value of x :

$$\frac{3}{9 + 6x + x^2} = \frac{3}{4} \rightarrow$$

$$\frac{1}{9 + 6x + x^2} = \frac{1}{4} \rightarrow$$

$$9 + 6x + x^2 = 4 \rightarrow$$

$$x^2 + 6x + 5 = 0 \rightarrow$$

$$(x + 5)(x + 1) = 0$$

$$x = -5 \text{ or } x = -1$$

Since $(x + 3)$ must be greater than zero, the only possible solution for x is -1 . Plugging this in to the expression gives us the same answer of 2:

$$(x + 3) \rightarrow -1 + 3 = 2$$

Advanced Math—Exponents and Roots

Exponent Rules

Memorize these exponent rules that are frequently tested on the SAT Math:

Exponent Rule	Example	How to Remember
$x^a x^b = x^{(a+b)}$	$x^2 x^3 = x^{(2+3)} = x^5$	Use the acronym MADSPM M ultiply exponents, A dd them D ivide exponents, S ubtract them P arentheses with exponents, M ultiply them
$\frac{x^a}{x^b} = x^{a-b}$	$\frac{x^5}{x^2} = x^{5-2} = x^3$	
$(x^a)^b = x^{(ab)}$	$(x^2)^3 = x^{(2 \times 3)} = x^6$	
$x^{-a} = \frac{1}{x^a}$	$x^{-3} = \frac{1}{x^3}$	"Negative" things go to the bottom.
$x^{\frac{a}{b}} = \sqrt[b]{x^a}$	$x^{\frac{2}{3}} = \sqrt[3]{x^2}$	The <u>root</u> of a tree is on the <u>bottom</u> . The bottom part of the fraction is identical to the <u>root</u> .

Practice

Write these expressions in simplified, alternative forms.

$$t^2 a^6 = ?$$

$$\frac{c^7}{c^4} = ?$$

$$r^{(3)} = ?$$

$$r^{-4} = ?$$

$$n^3)^4 = ?$$

$$x^2 x^3)^2 = ?$$

$$\frac{1}{t^{-3}} = ?$$

$$\sqrt[3]{216x^{12}} = ?$$

Solutions

$$a^2 a^6 = a^{(2+6)} = a^8$$

$$\frac{c^7}{c^4} = c^{(7-4)} = c^3$$

$$\sqrt[4]{y^3} = \text{the fourth root of } y^3 = \sqrt[4]{y^3}$$

$$b^{-4} = \frac{1}{b^4}$$

$$(n^3)^4 = n^{(3 \times 4)} = n^{12}$$

$$(x^2 x^3)^2 = (x^{(2+3)})^2 = (x^5)^2 = x^{(5 \times 2)} = x^{10}$$

$$\frac{1}{a^{-3}} \rightarrow$$

Bring the denominator up to the top since it has a negative exponent $\rightarrow$

$$\rightarrow a^3$$

$$\sqrt[3]{216x^{12}} \rightarrow$$

$$\sqrt[3]{(6 \times 6 \times 6) \times (x^4)(x^4)(x^4)} \rightarrow$$

$$6x^4$$

Problems with Exponents and Roots

SAT Math problems that involve exponents and roots will often ask you to integrate multiple concepts to arrive at a solution.

► Example

If $x^{(-\frac{1}{3})} = y$ and x is positive, what is x in terms of y ?

(A) $y = x^3$

(B) $y = \sqrt[3]{x}$

(C) $x = \frac{1}{y^3}$

(D) $x = y^3$

✓ Solution

When a problem asks you to put x in terms of y , it means that you should have x by itself and an expression in terms of y on the other side. So, we should isolate the x variable to arrive at a solution:

$$x^{-\frac{1}{3}} = y \rightarrow$$

Take each side to the -3 power to get a simple $x \rightarrow$

$$(x^{-\frac{1}{3}})^{-3} = y^{-3} \rightarrow$$

$$x^{-\frac{1}{3} \times -3} = y^{-3} \rightarrow$$

$$x^1 = y^{-3} \rightarrow$$

$$x = \frac{1}{y^3}$$

The SAT Math heavily emphasizes pattern recognition and does *not* emphasize tedious calculations. As a result, you will frequently find that problems involving exponents and roots will involve simple numbers and their exponential values and roots. Memorizing these equivalences will save you time.

SAT Math Strategy

Memorize the values of simple numbers to different powers to more easily recognize patterns.

$x^0 = 1$ Anything to the zero power is simply one. $1^0 = 1$ $2^0 = 1$ $10^0 = 1$

$2^1 = 2$ Anything to the 1st power is simply itself. $3^1 = 3$ $20^1 = 20$
 $(-5)^1 = -5$

$$2^2 = 4 \quad 2^3 = 8 \quad 2^4 = 16 \quad 2^5 = 32 \quad 2^6 = 64$$

$$\sqrt{4} = 2 \quad \sqrt[3]{8} = 2 \quad \sqrt[4]{16} = 2 \quad \sqrt[5]{32} = 2 \quad \sqrt[6]{64} = 2$$

$$3^2 = 9 \quad 3^3 = 27 \quad 3^4 = 81$$

$$\sqrt{9} = 3 \quad \sqrt[3]{27} = 3 \quad \sqrt[4]{81} = 3$$

$$4^2 = 16 \quad 4^3 = 64 \quad 4^4 = 256$$

$$\sqrt{16} = 4 \quad \sqrt[3]{64} = 4 \quad \sqrt[4]{256} = 4$$

$$5^2 = 25 \quad 5^3 = 125$$

$$\sqrt{25} = 5 \quad \sqrt[3]{125} = 5$$

$$6^2 = 36 \quad 6^3 = 216$$

$$\sqrt{36} = 6 \quad \sqrt[3]{216} = 6$$

$$7^2 = 49 \quad 8^2 = 64 \quad 9^2 = 81$$

$$\sqrt{49} = 7 \quad \sqrt{64} = 8 \quad \sqrt{81} = 9$$

$$10^2 = 100 \quad 10^3 = 1,000 \quad 10^4 = 10,000$$

$$\sqrt{100} = 10 \quad \sqrt[3]{1,000} = 10 \quad \sqrt[4]{10,000} = 10$$

▶ Example 1

If $2^{(x-5)} = 8$, what is the value of x ?

(A) 4

(B) 5

(C) 7

(D) 8

✓ Solution

Use your knowledge of the exponential values of 2 to see a shortcut. Since $2^3 = 8$, simply set the exponent of 2 equal to 3 to solve for x :

$$x - 5 = 3 \rightarrow x = 8$$

So, choice **(D)** is correct. Alternatively, you could work your way backwards from the answer choices. When you plug in choice (D), you will also arrive at the correct answer:

$$\begin{aligned} 2^{(x-5)} &= 8 \rightarrow \text{Plug in 8 for } x \rightarrow \\ 2^{(8-5)} &= 8 \rightarrow 2^3 = 8 \end{aligned}$$

Your knowledge of the exponential values of 2 will also help you quickly see the correct answer when you solve by plugging in the answer choices.

► Example 2

x	$f(x)$
1	1
2	4
3	9
4	16

In the table above, which of the following defines the function $f(x)$?

- (A) $f(x) = x + 3$
- (B) $f(x) = x^2$
- (C) $f(x) = -x^2$
- (D) $f(x) = x^3$

✓ Solution

Use your knowledge of the exponential values of simple numbers to recognize the pattern.

$$1^2 = 1$$

$$2^2 = 4$$

$$3^2 = 9$$

$$4^2 = 16$$

Choice **(B)**, $f(x) = x^2$, therefore correctly models this relationship.

Practice Drill—Exponents and Roots

(If timing, take about 12 minutes to complete.)

Which of these expressions is equivalent to $\sqrt[4]{x^3}$?

A) $x^{\frac{3}{4}}$

B) $\frac{x^3}{x^4}$

C) $\frac{x^4}{x^3}$

D) $x^{\frac{4}{3}}$

If $3x^2 - 27 = 0$, and $x > 0$, what is the value of x ?

A) 1

B) 2

C) 3

D) 4

$$f(x) = \frac{5^x}{2^x}$$

What is the value of $f(2)$ in the function above?

A) $\frac{25}{4}$

B) $\frac{5}{2}$

C) $\frac{10}{4}$

D) 8

If $f(x) = \frac{\sqrt{x}}{x}$, what is $f(9)$?

- A) $\frac{1}{9}$
- B) $\frac{1}{3}$
- C) 1
- D) 3

If x is positive, which expression is equivalent to $\sqrt[3]{27x^6}$?

- A) $3x$
- B) $3x^2$
- C) $6x^2$
- D) $9x^3$

x	$f(x)$
1	2
2	5
3	10
4	17
5	26

Based on the values in the table above, which of the following correctly expresses the value of $f(x)$?

- A) $f(x) = x + 1$
- B) $f(x) = x^2$
- C) $f(x) = x^3$
- D) $f(x) = x^2 + 1$

$$\frac{c^a y^{-b}}{c^{-a} y^b}$$

Consider the expression above, in which x and y are both positive, and a and b are positive constants. Which of the following would be an equivalent form of the expression?

- A) $\frac{x^a}{y^b}$
- B) $\frac{x^{(a^2)}}{y^{(b^2)}}$
- C) $\frac{x^{2a}}{y^{2b}}$
- D) $\frac{y}{x}$

Fill-In Practice: Write your answer in the underlined blank under each question.

$$\sqrt{125} + \sqrt[3]{64} = x^2$$

Given that $x > 0$, what is the value of x in the above equation?

Answer: _____

If $x^{-2}y^{-1} = \frac{1}{5}$, what is the value of x^4y^2 ?

Answer: _____

If $\sqrt[4]{x} = 4$, what is $\sqrt[5]{x}$?

Answer: _____

Solutions

1. (D)

$$\sqrt[4]{x^3} \rightarrow \text{The root, 4, is on the outside} \rightarrow \\ = x^{\left(\frac{3}{4}\right)}$$

2. (C)

$$3x^2 - 27 = 0 \rightarrow$$

$$3x^2 = 27 \rightarrow$$

$$x^2 = 9 \rightarrow$$

$$x = 3$$

Alternatively, you could have tried plugging in the answer choices to the original equation.

3. **(A)**

$$f(x) = \frac{5^x}{2^x} \rightarrow$$

$$f(2) = \frac{5^2}{2^2} \rightarrow$$

$$f(2) = \frac{25}{4}$$

4. **(B)**

$$f(x) = \frac{\sqrt{x}}{x} \rightarrow$$

$$f(9) = \frac{\sqrt{9}}{9} \rightarrow$$

$$f(9) = \frac{3}{9} = \frac{1}{3}$$

5. **(B)**

$$\sqrt[3]{27x^6} \rightarrow$$

Take the cube root of both 27 and $x^6 \rightarrow$

$$= 3x^2$$

6. **(D)** Try plugging some sample values into the answer choices to determine the answer. When you try the first ordered pair, (1, 2), choices (B) and (C) can be eliminated. When you try the next ordered pair, (2, 5), choice (A) can be eliminated. Only choice **(D)**, $f(x) = x^2 + 1$, correctly models the function.