

Pre-Algebra & Geometry

Self-Study Worksheet · 20 Questions · Answer Key on Last Page

SECTION A — PRE-ALGEBRA

Order of operations · variables · equations · proportions · percentages

Q01 ORDER OF OPERATIONS

What is the value of $3 + 4 \times 2 - 1$?

KEY: PEMDAS — Multiply/Divide BEFORE Add/Subtract

- A) 13
 - B) 10
 - C) 15
 - D) 7
-

Q02 SOLVING EQUATIONS

Solve for x: $2x + 5 = 17$

KEY: ISOLATE — do the same step on BOTH sides

- A) $x = 6$
 - B) $x = 11$
 - C) $x = 7$
 - D) $x = 4$
-

Q03 NEGATIVE NUMBERS

A submarine is at -40 feet. It rises 15 feet. What is its new depth?

KEY: RISE = add a positive. SINK = subtract (go more negative)

- A) -55 ft
 - B) -25 ft
 - C) 25 ft
 - D) -45 ft
-

Q04 RATIOS & PROPORTIONS

A recipe uses 3 cups of flour for every 2 cups of sugar. How many cups of flour for 8 cups of sugar?

KEY: PROPORTION — set up $a/b = c/d$, then cross-multiply

- A) 12 cups
 - B) 10 cups
 - C) 6 cups
 - D) 16 cups
-

Q05 PERCENTAGES

A jacket costs \$80 and is on sale for 25% off. What is the sale price?

KEY: DISCOUNT = Price \times rate. Sale = Original - Discount

- A) \$55
 - B) \$60
 - C) \$20
 - D) \$65
-

Q06 EXPRESSIONS & VARIABLES

What is $3a(^2) - 2b$ when $a = 2$ and $b = 3$?

KEY: SUBSTITUTE first, then follow PEMDAS (exponent before multiply)

- A) 6
 - B) 12
 - C) 18
 - D) 30
-

Q07 INEQUALITIES

Which value of x satisfies $3x - 4 > 8$?

KEY: FLIP inequality only when multiplying/dividing by a NEGATIVE

- A) $x = 2$
 - B) $x = 4$
 - C) $x = 5$
 - D) $x = 3$
-

Q08 NUMBER PATTERNS

What is the next term? 2, 6, 18, 54, ____

KEY: RATIO — divide any term by the previous to find the common ratio

- A) 108
 - B) 162
 - C) 144
 - D) 120
-

Q09 FRACTIONS & MIXED NUMBERS

What is $2\frac{1}{3} + 1\frac{3}{4}$?

KEY: LCD — find Least Common Denominator before adding fractions

- A) 3 and $\frac{13}{12}$
 - B) 4 and $\frac{1}{12}$
 - C) 3 and $\frac{1}{2}$
 - D) 4 and $\frac{5}{12}$
-

Q10 TWO-STEP EQUATIONS

A student earns \$7/hr and has \$15 saved. She needs at least \$50 total. How many MORE hours must she work? (Use: $7h + 15 = 50$)

KEY: WORD TO EQUATION — find the unknown, write the equation, solve

- A) 4 hours
 - B) 5 hours
 - C) 6 hours
 - D) 7 hours
-

SECTION B — GEOMETRY

Angles · area / perimeter · triangles · circles · coordinate plane

Q11 ANGLE TYPES

Two angles are supplementary. One angle is 65 degrees. What is the other?

KEY: SUPPLEMENTARY = 180 deg. COMPLEMENTARY = 90 deg

- A) 25 deg
 - B) 115 deg
 - C) 125 deg
 - D) 135 deg
-

Q12 AREA OF A TRIANGLE

A triangle has base = 10 cm and height = 6 cm. What is its area?

KEY: TRIANGLE AREA = $(1/2) \times \text{base} \times \text{height}$ — don't forget the $1/2$!

- A) 60 cm^(^2)
 - B) 30 cm^(^2)
 - C) 16 cm^(^2)
 - D) 32 cm^(^2)
-

Q13 PYTHAGOREAN THEOREM

A right triangle has legs 3 and 4. What is the hypotenuse?

KEY: $a^{(2)} + b^{(2)} = c^{(2)}$ — hypotenuse c is always the LONGEST side

- A) 7
 - B) 5
 - C) 6
 - D) 25
-

Q14 CIRCLE — CIRCUMFERENCE

A circle has radius = 7 cm. What is its circumference? ($\pi = 3.14$)

KEY: $C = 2(\pi)r$ for circumference. $A = (\pi)r^{(2)}$ for area

- A) 43.96 cm
 - B) 153.86 cm
 - C) 21.98 cm
 - D) 49 cm
-

Q15 PERIMETER

A rectangle is 9 m long and 4 m wide. What is its perimeter?

KEY: PERIMETER = distance around. Rectangle: $P = 2(l + w)$

- A) 36 m
 - B) 26 m
 - C) 13 m
 - D) 52 m
-

Q16 PARALLEL LINES & ANGLES

Two parallel lines are cut by a transversal. One angle is 70 deg. What is its co-interior (same-side interior) angle?

KEY: CO-INTERIOR angles are SUPPLEMENTARY (sum = 180 deg)

- A) 70 deg
 - B) 110 deg
 - C) 20 deg
 - D) 140 deg
-

Q17 COORDINATE PLANE

What is the distance between A(1, 2) and B(4, 6)?

KEY: Distance = $\sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$]

- A) 3
 - B) 7
 - C) 5
 - D) $\sqrt{7}$
-

Q18 VOLUME

A box measures 5 cm x 3 cm x 4 cm. What is its volume?

KEY: VOLUME = l x w x h (count unit cubes)

- A) 24 cm³
 - B) 94 cm³
 - C) 60 cm³
 - D) 47 cm³
-

Q19 TRIANGLE ANGLE SUM

A triangle has angles of 45 deg and 70 deg. What is the third angle?

KEY: TRIANGLE SUM = always 180 deg. Missing = 180 - (other two)

- A) 55 deg
 - B) 65 deg
 - C) 75 deg
 - D) 115 deg
-

Q20 CIRCLE — AREA

A circular pizza has diameter = 12 inches. What is its area? (pi = 3.14)

KEY: DIAMETER / 2 = RADIUS first! Then $A = (\pi)r^2$

- A) 452.16 in^(^2)
- B) 37.68 in^(^2)
- C) 113.04 in^(^2)
- D) 75.36 in^(^2)

ANSWER KEY

| Q# | Ans | Q# | Ans |
|-----|-----|-----|-----|
| Q01 | B | Q02 | A |
| Q03 | B | Q04 | A |
| Q05 | B | Q06 | A |
| Q07 | C | Q08 | B |
| Q09 | B | Q10 | B |
| Q11 | B | Q12 | B |
| Q13 | B | Q14 | A |
| Q15 | B | Q16 | B |
| Q17 | C | Q18 | C |
| Q19 | B | Q20 | C |