

All

★ Easy

★★ Medium

★★★ Hard

U1: BASICS

Q01 U1: BASICS

Evaluate: $3 + 4 \times 2$

Q02 U1: BASICS

Simplify: $-3 + (-5)$

Q03 U1: BASICS

What is the value of $|-7|$?

Q04 U1: BASICS

Which property is shown? $3(x + 4) = 3x + 12$

Q05 U1: BASICS

Simplify: $5x + 3x$

Q06 U1: BASICS

Simplify: $2(3x - 4) + 5x$

Q07 U1: BASICS

Which expression equals $-2(x - 5)$?

Q08 U1: BASICS

Evaluate $a^2 - 3b$ when $a = 4$, $b = 2$.

Q09 U1: BASICS

Which set contains only integers?

Q10 U1: BASICS

Simplify: $3x^2 + 2x - x^2 + 4x - 5$

U2: LINEAR EQ

Q11 U2: LINEAR EQ

Solve: $x + 7 = 12$

Q12 U2: LINEAR EQ

Solve: $3x = 18$

Q13 U2: LINEAR EQ

Solve: $2x - 5 = 11$

Q14 U2: LINEAR EQ

Solve: $x/4 = 3$

Q15 U2: LINEAR EQ

Solve: $5x + 3 = 2x + 12$

Q16 U2: LINEAR EQ

Solve: $4(x - 2) = 16$

Q17 U2: LINEAR EQ

The slope of the line $y = -3x + 5$ is:

Q18 U2: LINEAR EQ

Find the y-intercept of $2x + y = 8$.

Q19 U2: LINEAR EQ

Find the equation of a line with slope 2 through point (1, 5).

Q20 U2: LINEAR EQ

Two lines are parallel when they have:

U3: INEQUALITIES

Q21 U3: INEQUALITIES

Solve: $x + 3 > 7$

Q22 U3: INEQUALITIES

Solve: $2x \leq 10$

Q23 U3: INEQUALITIES

When you multiply both sides of an inequality by a **negative** number:

Q24 U3: INEQUALITIES

Solve: $-3x + 2 > 11$

Q25 U3: INEQUALITIES

Which graph shows $x < 2$?

Q26 U3: INEQUALITIES

Solve and express as interval notation: $-1 < x \leq 5$

Q27 U3: INEQUALITIES

Solve: $|x - 3| < 5$

Q28 U3: INEQUALITIES

Solve: $|2x + 1| \geq 7$

Q29 U3: INEQUALITIES

A number is within 3 units of 10. Which inequality models this?

Q30 U3: INEQUALITIES

Solve: $3 < 2x - 1 \leq 9$

U4: FUNCTIONS

Q31 U4: FUNCTIONS

Which of these is NOT a function?

Q32 U4: FUNCTIONS

For $f(x) = 2x + 3$, find $f(4)$.

Q33 U4: FUNCTIONS

What is the domain of $f(x) = x + 5$?

Q34 U4: FUNCTIONS

The function $f(x) = x^2 - 4$. Find $f(-3)$.

Q35 U4: FUNCTIONS

Which type of function has graph shaped like a V?

Q36 U4: FUNCTIONS

What is the slope of the line through $(2, 5)$ and $(6, 13)$?

Q37 U4: FUNCTIONS

A function's table has x: 1,2,3 and y: 4,7,10. What is the rule?

Q38 U4: FUNCTIONS

If $f(x) = x^2 + 1$ and $g(x) = 2x$, find $f(g(3))$.

Q39 U4: FUNCTIONS

Which describes a **decreasing** linear function?

Q40 U4: FUNCTIONS

Find the x-intercept of $y = 2x - 8$.

U5: SYSTEMS

Q41 U5: SYSTEMS

The solution to a system of equations is where the lines:

Q42 U5: SYSTEMS

Solve by substitution: $y = 2x$ and $x + y = 9$

Q43 U5: SYSTEMS

Solve by elimination: $x + y = 7$ and $x - y = 3$

Q44 U5: SYSTEMS

A system has NO solution when the lines are:

Q45 U5: SYSTEMS

A system has **infinitely many** solutions when the lines are:

Q46 U5: SYSTEMS

Solve: $2x + y = 5$ and $y = x - 1$

Q47 U5: SYSTEMS

Solve: $3x + 2y = 12$ and $x - y = 1$

Q48 U5: SYSTEMS

Tickets cost \$4 for children and \$7 for adults. 50 tickets sold for \$281. How many adult tickets?

Q49 U5: SYSTEMS

If $2x + 3y = 6$ and $4x + 6y = 12$, the system has:

Q50 U5: SYSTEMS

The lines $y = 2x + 1$ and $y = 2x - 3$ have:

U6: EXPONENTS

Q51 U6: EXPONENTS

Simplify: $x^3 \cdot x^4$

Q 52 U6: EXPONENTS

Simplify: $(x^2)^3$

Q 53 U6: EXPONENTS

What is 5^0 ?

Q 54 U6: EXPONENTS

Simplify: $x^5 \div x^2$

Q 55 U6: EXPONENTS

What is 2^{-3} ?

Q 56 U6: EXPONENTS

Simplify: $(2x^2y)^3$

Q 57 U6: EXPONENTS

Write 0.00045 in scientific notation.

Q58 U6: EXPONENTS

Simplify: $(3x^3)^2 / (9x^4)$

Q59 U6: EXPONENTS

Evaluate: $4^{(3/2)}$

Q60 U6: EXPONENTS

Which is equivalent to $\sqrt{x^6}$?

U7: POLYNOMIALS

Q61 U7: POLYNOMIALS

What is the degree of $4x^3 - 2x + 7$?

Q62 U7: POLYNOMIALS

Add: $(3x^2 + 2x) + (x^2 - 5x + 4)$

Q63 U7: POLYNOMIALS

Subtract: $(5x^2 - 3x) - (2x^2 + x - 4)$

Q64 U7: POLYNOMIALS

Multiply: $3x(2x - 5)$

Q65 U7: POLYNOMIALS

Multiply: $(x + 3)(x + 4)$

Q66 U7: POLYNOMIALS

Multiply: $(x - 5)(x + 5)$

Q67 U7: POLYNOMIALS

Multiply: $(x + 3)^2$

Q68 U7: POLYNOMIALS

Multiply: $(2x - 1)(3x + 4)$

Q69 U7: POLYNOMIALS

What type of polynomial is $7x^2 - 3x + 1$?

Q70 U7: POLYNOMIALS

Divide: $(6x^2 + 9x) \div 3x$

U8: FACTORING

Q71 U8: FACTORING

Factor out the GCF: $6x^2 + 9x$

Q72 U8: FACTORING

Factor: $x^2 + 7x + 12$

Q73 U8: FACTORING

Factor: $x^2 - 5x + 6$

Q74 U8: FACTORING

Factor: $x^2 - 9$

Q75 U8: FACTORING

Factor: $x^2 - 2x - 15$

Q76 U8: FACTORING

Factor completely: $2x^2 + 8x$

Q77 U8: FACTORING

Factor: $x^2 + 10x + 25$

Q78 U8: FACTORING

Factor: $3x^2 + 11x + 6$

Q79 U8: FACTORING

Solve by factoring: $x^2 - 4x = 0$

Q80 U8: FACTORING

Solve by factoring: $x^2 + x - 6 = 0$

U9: QUADRATICS

Q81 U9: QUADRATICS

In $y = ax^2 + bx + c$, what shape is the graph?

Q82 U9: QUADRATICS

The vertex of $y = (x - 3)^2 + 5$ is:

Q83 U9: QUADRATICS

Use the quadratic formula to solve $x^2 + 5x + 6 = 0$.

Q84 U9: QUADRATICS

The quadratic formula is: $x =$

Q85 U9: QUADRATICS

The discriminant of $x^2 - 4x + 5 = 0$ is:

Q86 U9: QUADRATICS

If the discriminant is **negative**, the quadratic has:

Q87 U9: QUADRATICS

Solve: $2x^2 - 8 = 0$

Q88 U9: QUADRATICS

The axis of symmetry of $y = 2x^2 + 8x + 3$ is:

Q89 U9: QUADRATICS

Solve: $x^2 - 6x + 9 = 0$

Q90 U9: QUADRATICS

A ball's height: $h = -t^2 + 4t$. When does it hit the ground?

U10: STATISTICS

Q91 U10: STATISTICS

Find the mean of: 4, 8, 6, 2, 10

Q92 U10: STATISTICS

Find the median of: 3, 7, 1, 9, 5

Q93 U10: STATISTICS

Find the mode of: 2, 4, 2, 7, 4, 4, 9

Q94 U10: STATISTICS

Find the range of: 12, 5, 19, 3, 8

Q95 U10: STATISTICS

In a box plot, what does the box represent?

Q96 U10: STATISTICS

Which measure of central tendency is MOST affected by outliers?

Q97 U10: STATISTICS

A scatter plot shows as x increases, y increases. The correlation is:

Q98 U10: STATISTICS

What is the IQR of: 2, 5, 7, 9, 11, 14, 18 ?

Q99 U10: STATISTICS

The correlation coefficient $r = -0.95$ means:

Q100 U10: STATISTICS

The line of best fit for a data set passes through (0, 3) and (5, 13). Its equation is:

Algebra 1

100 ESSENTIAL PROBLEMS — COMPLETE STUDY GUIDE

All units covered · Difficulty graded · Self-study ready

★ = Easy ★★ = Medium ★★★ = Hard

U1: BASICS

Q01 ★ Evaluate: $3 + 4 \times 2$

A. 14

B. 10

C. 11

D. 9

💡 Remember PEMDAS: multiply before you add.

Q02 ★ Simplify: $-3 + (-5)$

A. -8

B. 8

C. -2

D. 2

💡 Adding two negatives makes a larger negative.

Q03 ★ What is the value of $|-7|$?

A. -7

B. 7

C. 0

D. 49

💡 Absolute value = distance from 0, always non-negative.

Q04 ★ Which property is shown? $3(x + 4) = 3x + 12$

A. Commutative

B. Associative

C. Distributive

D. Identity

💡 Which property multiplies through parentheses?

Q05 ★ Simplify: $5x + 3x$

A. 8

B. $8x$

C. $15x$

D. $53x$

💡 Combine like terms — terms with the same variable.

Q06 ★★ Simplify: $2(3x - 4) + 5x$

A. $11x - 8$

B. $11x - 4$

C. $6x - 8$

D. $11x + 8$

💡 Distribute 2 first, then combine like terms.

Q07 ★★ Which expression equals $-2(x - 5)$?

A. $-2x - 10$

B. $-2x + 10$

C. $2x - 10$

D. $2x + 10$

💡 Distribute -2 to both terms inside parentheses.

Q08 ★★ Evaluate $a^2 - 3b$ when $a = 4$, $b = 2$.

A. 22

B. 10

C. 14

D. 16

💡 Substitute first, then follow order of operations.

- Q09 ★★ Which set contains only integers?
- A. $\{-3, 0, \frac{1}{2}, 4\}$ B. $\{-3, 0, 4, 7\}$
C. $\{0.5, 1, 2, 3\}$ D. $\{\pi, 2, 5\}$
- 💡 Integers are whole numbers including negatives; no fractions or decimals.

- Q10 ★★★ Simplify: $3x^2 + 2x - x^2 + 4x - 5$
- A. $2x^2 + 6x - 5$ B. $4x^2 + 6x - 5$
C. $2x^2 - 6x + 5$ D. $2x^2 + 6x + 5$
- 💡 Group like terms: x^2 terms, x terms, constants.

U2: LINEAR EQ

- Q11 ★ Solve: $x + 7 = 12$
- A. 5 B. 19
C. -5 D. 7
- 💡 Subtract 7 from both sides.

- Q12 ★ Solve: $3x = 18$
- A. 54 B. 15
C. 6 D. 21
- 💡 Divide both sides by 3.

- Q13 ★ Solve: $2x - 5 = 11$
- A. 3 B. 8
C. 6 D. 16
- 💡 Add 5 first, then divide by 2.

- Q14 ★ Solve: $x/4 = 3$
- A. 7 B. 12
C. $\frac{3}{4}$ D. 1
- 💡 Multiply both sides by 4.

- Q15 ★★ Solve: $5x + 3 = 2x + 12$
- A. 3 B. 5
C. 9 D. 15
- 💡 Move all x terms to one side, constants to the other.

- Q16 ★★ Solve: $4(x - 2) = 16$
- A. 2 B. 4
C. 6 D. 8
- 💡 Divide by 4 first (or distribute first), then solve.

Q17 ★★ The slope of the line $y = -3x + 5$ is:

- A. 5
- B. -3
- C. 3
- D. -5

💡 In $y = mx + b$, m is the slope.

Q18 ★★ Find the y-intercept of $2x + y = 8$.

- A. 4
- B. -4
- C. 8
- D. 2

💡 Set $x = 0$ and solve for y .

Q19 ★★★ Find the equation of a line with slope 2 through point (1, 5).

- A. $y = 2x + 3$
- B. $y = 2x + 5$
- C. $y = 2x - 3$
- D. $y = 5x + 2$

💡 Use point-slope: $y - y_1 = m(x - x_1)$.

Q20 ★★★ Two lines are parallel when they have:

- A. Same y-intercept
- B. Same slope
- C. Opposite slopes
- D. Product of slopes = -1

💡 Parallel lines never intersect — what must be equal?

U3: INEQUALITIES

Q21 ★ Solve: $x + 3 > 7$

- A. $x > 10$
- B. $x > 4$
- C. $x < 4$
- D. $x > 3$

💡 Treat like an equation, subtract 3 from both sides.

Q22 ★ Solve: $2x \leq 10$

- A. $x \leq 5$
- B. $x \leq 8$
- C. $x \geq 5$
- D. $x \leq 20$

💡 Divide both sides by 2. Sign doesn't flip (positive divisor).

Q23 ★★ When you multiply both sides of an inequality by a **negative** number:

- A. Add 1 to both sides
- B. Nothing changes
- C. Flip the inequality sign
- D. Subtract from both sides

💡 This is the key rule that makes inequalities different from equations.

Q24 ★★ Solve: $-3x + 2 > 11$

- A. $x > -3$
- B. $x < -3$
- C. $x > 3$
- D. $x < 3$

💡 Subtract 2, then divide by -3 (flip the sign!).

- Q25 ★★ Which graph shows $x < 2$?
- A. Open circle at 2, shaded left B. Closed circle at 2, shaded left
C. Open circle at 2, shaded right D. Closed circle at 2, shaded right
- 💡 $<$ means 'not including' $\rightarrow$ open circle. Less than $\rightarrow$ left.

- Q26 ★★ Solve and express as interval notation: $-1 < x \leq 5$
- A. $[-1, 5)$ B. $(-1, 5]$
C. $(-1, 5)$ D. $[-1, 5]$
- 💡 $()$ means open/not included, $[\]$ means closed/included.

- Q27 ★★★ Solve: $|x - 3| < 5$
- A. $-2 < x < 8$ B. $x < -2$ or $x > 8$
C. $x > 8$ D. $-8 < x < 2$
- 💡 For $|A| < k$, write $-k < A < k$.

- Q28 ★★★ Solve: $|2x + 1| \geq 7$
- A. $-4 \leq x \leq 3$ B. $x \leq -4$ or $x \geq 3$
C. $x \geq 3$ D. $x \leq -4$
- 💡 For $|A| \geq k$, write $A \leq -k$ or $A \geq k$.

- Q29 ★★★ A number is within 3 units of 10. Which inequality models this?
- A. $|x - 10| < 3$ B. $|x + 10| < 3$
C. $|x| < 3$ D. $|x - 3| < 10$
- 💡 'Within d units of c ' is always $|x - c| < d$.

- Q30 ★★ Solve: $3 < 2x - 1 \leq 9$
- A. $2 < x \leq 5$ B. $1 < x < 5$
C. $2 \leq x \leq 5$ D. $3 < x \leq 5$
- 💡 Add 1 to all three parts, then divide everything by 2.

U4: FUNCTIONS

- Q31 ★ Which of these is NOT a function?
- A. $y = 3x + 1$ B. $\{(1, 2), (2, 3), (3, 4)\}$
C. $x = y^2$ D. $\{(1, 5), (2, 5), (3, 5)\}$
- 💡 A function: each x -value maps to exactly one y -value. Use vertical line test.

- Q32 ★ For $f(x) = 2x + 3$, find $f(4)$.
- A. 11 B. 9
C. 10 D. 8
- 💡 Substitute $x = 4$.

- Q33 ★ What is the domain of $f(x) = x + 5$?
- A. $x \geq 0$ B. $x > 5$
C. All real numbers D. $x \neq 0$

💡 Is there any value of x that causes a problem here?

- Q34 ★★ The function $f(x) = x^2 - 4$. Find $f(-3)$.
- A. 5 B. -13
C. 13 D. -5

💡 Substitute $x = -3$. Remember $(-3)^2 = 9$.

- Q35 ★★ Which type of function has graph shaped like a V?
- A. Linear B. Quadratic
C. Absolute value D. Square root

💡 Think of $f(x) = |x|$.

- Q36 ★★ What is the slope of the line through (2, 5) and (6, 13)?
- A. 2 B. 3
C. 4 D. 18

💡 $Slope = (y_2 - y_1) \div (x_2 - x_1)$.

- Q37 ★★ A function's table has x : 1,2,3 and y : 4,7,10. What is the rule?
- A. $y = 2x + 2$ B. $y = 3x + 1$
C. $y = 4x$ D. $y = x + 3$

💡 Find how y changes per step, then find the starting point.

- Q38 ★★★ If $f(x) = x^2 + 1$ and $g(x) = 2x$, find $f(g(3))$.
- A. 37 B. 19
C. 13 D. 7

💡 Evaluate $g(3)$ first, then use that result as input to f .

- Q39 ★★★ Which describes a **decreasing** linear function?
- A. Positive slope B. Negative slope
C. Slope = 0 D. Undefined slope

💡 As x increases, y goes down. What does that mean for slope?

- Q40 ★★★ Find the x -intercept of $y = 2x - 8$.
- A. 4 B. -4
C. 8 D. 2

💡 Set $y = 0$ and solve for x .

- Q41 ★ The solution to a system of equations is where the lines:
- A. Are parallel
 - B. Have same slope
 - C. Intersect
 - D. Have same y-intercept
- 💡 Think about what a 'solution' means graphically.
- Q42 ★★ Solve by substitution: $y = 2x$ and $x + y = 9$
- A. (3, 6)
 - B. (6, 3)
 - C. (2, 7)
 - D. (4, 5)
- 💡 Substitute $y = 2x$ into the second equation.
- Q43 ★★ Solve by elimination: $x + y = 7$ and $x - y = 3$
- A. (5, 2)
 - B. (2, 5)
 - C. (4, 3)
 - D. (3, 4)
- 💡 Add the equations to eliminate y .
- Q44 ★★ A system has NO solution when the lines are:
- A. Intersecting
 - B. Coincident
 - C. Parallel
 - D. Perpendicular
- 💡 Same slope, different intercepts — they never meet.
- Q45 ★★ A system has **infinitely many** solutions when the lines are:
- A. Parallel
 - B. Coincident (same line)
 - C. Perpendicular
 - D. Intersecting
- 💡 If it's really the same line, every point works.
- Q46 ★★ Solve: $2x + y = 5$ and $y = x - 1$
- A. (1, 0)
 - B. (2, 1)
 - C. (0, 5)
 - D. (3, 2)
- 💡 Substitute $y = x - 1$ into the first equation.
- Q47 ★★★ Solve: $3x + 2y = 12$ and $x - y = 1$
- A. (14/5, 9/5)
 - B. (2, 3)
 - C. (3, 2)
 - D. (5, 2)
- 💡 From equation 2: $x = y + 1$. Substitute.
- Q48 ★★★ Tickets cost \$4 for children and \$7 for adults. 50 tickets sold for \$281. How many adult tickets?
- A. 27
 - B. 23
 - C. 30
 - D. 20
- 💡 Set up two equations: one for count, one for money.

- Q57 ★★ Write 0.00045 in scientific notation.
- A. 4.5×10^3 B. 4.5×10^{-4}
C. 45×10^{-5} D. 4.5×10^4

💡 Move the decimal point to get a number between 1 and 10. Count moves.

- Q58 ★★★ Simplify: $(3x^3)^2/(9x^4)$
- A. x^2 B. $x/3$
C. $9x^6$ D. x

💡 Expand the numerator first, then simplify.

- Q59 ★★★ Evaluate: $4^{(3/2)}$
- A. 6 B. 8
C. 12 D. 16

💡 Rational exponent $a/b = (\text{bth root})^a$. So $4^{(3/2)} = (\sqrt{4})^3$.

- Q60 ★★★ Which is equivalent to $\sqrt{x^6}$?
- A. x^3 B. x^2
C. x^6 D. $3x$

💡 $\sqrt[n]{(x^a)} = x^{(n/2)}$. Or think: what squared gives x^6 ?

U7: POLYNOMIALS

- Q61 ★ What is the degree of $4x^3 - 2x + 7$?
- A. 1 B. 2
C. 3 D. 4

💡 The degree is the highest power of the variable.

- Q62 ★ Add: $(3x^2 + 2x) + (x^2 - 5x + 4)$
- A. $4x^2 - 3x + 4$ B. $4x^2 + 7x + 4$
C. $2x^2 - 3x + 4$ D. $4x^2 - 3x - 4$

💡 Combine like terms: x^2 terms, x terms, constants.

- Q63 ★★ Subtract: $(5x^2 - 3x) - (2x^2 + x - 4)$
- A. $3x^2 - 4x + 4$ B. $7x^2 - 2x - 4$
C. $3x^2 - 4x - 4$ D. $3x^2 + 4x + 4$

💡 Distribute the minus sign to every term of the second polynomial.

- Q64 ★★ Multiply: $3x(2x - 5)$
- A. $6x^2 - 15x$ B. $6x^2 - 5$
C. $5x^2 - 15x$ D. $6x - 15x$

💡 Distribute $3x$ to each term inside.

Q65 ★★ Multiply: $(x + 3)(x + 4)$

A. $x^2 + 7x + 12$

B. $x^2 + 12$

C. $x^2 + 7x + 7$

D. $x^2 + 12x + 7$

💡 Use FOIL: First, Outer, Inner, Last.

Q66 ★★ Multiply: $(x - 5)(x + 5)$

A. $x^2 - 10x + 25$

B. $x^2 + 25$

C. $x^2 - 25$

D. $x^2 + 10x - 25$

💡 This is a 'difference of squares' pattern: $(a-b)(a+b) = a^2 - b^2$.

Q67 ★★ Multiply: $(x + 3)^2$

A. $x^2 + 9$

B. $x^2 + 6x + 9$

C. $x^2 + 3x + 9$

D. $x^2 + 6x + 6$

💡 $(a + b)^2 = a^2 + 2ab + b^2$. Don't just square each term!

Q68 ★★★ Multiply: $(2x - 1)(3x + 4)$

A. $6x^2 + 5x - 4$

B. $6x^2 - 5x + 4$

C. $6x^2 + 5x + 4$

D. $5x^2 + 5x - 4$

💡 FOIL carefully: F= $6x^2$, O= $8x$, I= $-3x$, L= -4 .

Q69 ★★★ What type of polynomial is $7x^2 - 3x + 1$?

A. Monomial

B. Binomial

C. Trinomial

D. None of these

💡 Count the terms.

Q70 ★★★ Divide: $(6x^2 + 9x) \div 3x$

A. $2x + 3$

B. $3x + 9$

C. $2x^2 + 3x$

D. $6x + 9$

💡 Divide each term of the numerator by $3x$.

U8: FACTORING

Q71 ★ Factor out the GCF: $6x^2 + 9x$

A. $3(2x^2 + 3x)$

B. $3x(2x + 3)$

C. $6x(x + 3)$

D. $x(6x + 9)$

💡 Find the greatest common factor of both terms, including the variable.

Q72 ★★ Factor: $x^2 + 7x + 12$

A. $(x + 3)(x + 4)$

B. $(x + 2)(x + 6)$

C. $(x + 1)(x + 12)$

D. $(x + 7)(x + 5)$

💡 Find two numbers that multiply to 12 and add to 7.

- Q73 ★★ Factor: $x^2 - 5x + 6$
- A. $(x - 2)(x - 3)$ B. $(x + 2)(x + 3)$
 C. $(x - 1)(x - 6)$ D. $(x + 1)(x - 6)$
- 💡 Need two negatives that multiply to +6 and add to -5.
- Q74 ★★ Factor: $x^2 - 9$
- A. $(x - 3)^2$ B. $(x + 3)(x + 3)$
 C. $(x - 3)(x + 3)$ D. Cannot be factored
- 💡 Recognize the difference of squares pattern: $a^2 - b^2$.
- Q75 ★★ Factor: $x^2 - 2x - 15$
- A. $(x - 5)(x + 3)$ B. $(x + 5)(x - 3)$
 C. $(x - 3)(x - 5)$ D. $(x + 5)(x + 3)$
- 💡 Need two numbers: product = -15, sum = -2.
- Q76 ★★★ Factor completely: $2x^2 + 8x$
- A. $x(2x + 8)$ B. $2(x^2 + 8x)$
 C. $2x(x + 4)$ D. $2x(x + 8)$
- 💡 Factor out the GCF of all terms, including the variable.
- Q77 ★★★ Factor: $x^2 + 10x + 25$
- A. $(x + 5)^2$ B. $(x + 5)(x - 5)$
 C. $(x + 10)(x + 15)$ D. $(x + 25)^2$
- 💡 Check if this is a perfect square trinomial: $(a + b)^2$.
- Q78 ★★★ Factor: $3x^2 + 11x + 6$
- A. $(3x + 2)(x + 3)$ B. $(3x + 3)(x + 2)$
 C. $(x + 6)(3x + 1)$ D. $(3x + 6)(x + 1)$
- 💡 For $ax^2 + bx + c$ with $a \neq 1$: find two numbers with product= $ac=18$, sum= 11 .
- Q79 ★★★ Solve by factoring: $x^2 - 4x = 0$
- A. $x = 0$ and $x = 4$ B. $x = 4$ only
 C. $x = 0$ only D. $x = -4$ and $x = 0$
- 💡 Factor out x first, then set each factor equal to zero.
- Q80 ★★★ Solve by factoring: $x^2 + x - 6 = 0$
- A. $x = 2$ and $x = -3$ B. $x = 3$ and $x = -2$
 C. $x = -1$ and $x = 6$ D. $x = 1$ and $x = -6$
- 💡 Factor the trinomial, then use zero-product property.

Q81 ★ In $y = ax^2 + bx + c$, what shape is the graph?

A. Line

B. Parabola

C. Circle

D. V-shape

💡 Quadratic functions always have this curved shape.

Q82 ★★ The vertex of $y = (x - 3)^2 + 5$ is:

A. (-3, 5)

B. (3, 5)

C. (3, -5)

D. (5, 3)

💡 Vertex form: $y = (x - h)^2 + k$, vertex = (h, k).

Q83 ★★ Use the quadratic formula to solve $x^2 + 5x + 6 = 0$.

A. $x = -2, -3$

B. $x = 2, 3$

C. $x = -1, -6$

D. $x = 1, 6$

💡 Or factor: find two numbers that multiply to 6 and add to 5.

Q84 ★★ The quadratic formula is: $x =$

A. $(-b \pm \sqrt{b^2 - 4ac}) / 2a$

B. $(b \pm \sqrt{b^2 + 4ac}) / 2a$

C. $-b/2a$

D. $-b \pm \sqrt{b^2 - 4ac}$

💡 The discriminant is under the radical sign.

Q85 ★★ The discriminant of $x^2 - 4x + 5 = 0$ is:

A. -4

B. 4

C. 36

D. -4

💡 Discriminant = $b^2 - 4ac$.

Q86 ★★ If the discriminant is **negative**, the quadratic has:

A. 2 real solutions

B. 1 real solution

C. No real solutions

D. Infinite solutions

💡 Negative under the square root $\rightarrow$ not a real number.

Q87 ★★★ Solve: $2x^2 - 8 = 0$

A. $x = \pm 4$

B. $x = \pm 2$

C. $x = 4$

D. $x = 2$

💡 Isolate x^2 . Add 8, divide by 2, then take square root.

Q88 ★★★ The axis of symmetry of $y = 2x^2 + 8x + 3$ is:

A. $x = -2$

B. $x = 2$

C. $x = -4$

D. $x = 4$

💡 Axis of symmetry: $x = -b/(2a)$.

Q89 ★★★ Solve: $x^2 - 6x + 9 = 0$

A. $x = 3$ (double root)

B. $x = -3$

C. $x = 3$ and $x = -3$

D. $x = 9$

💡 *Is this a perfect square trinomial?*

Q90 ★★★ A ball's height: $h = -t^2 + 4t$. When does it hit the ground?

A. $t = 2$

B. $t = 4$

C. $t = 0$ and $t = 4$

D. $t = 0$ and $t = 2$

💡 *Set $h = 0$ and solve.*

U10: STATISTICS

Q91 ★ Find the mean of: 4, 8, 6, 2, 10

A. 5

B. 6

C. 7

D. 8

💡 *Mean = sum $\div$ count.*

Q92 ★ Find the median of: 3, 7, 1, 9, 5

A. 5

B. 7

C. 3

D. 9

💡 *Sort first, then find the middle value.*

Q93 ★ Find the mode of: 2, 4, 2, 7, 4, 4, 9

A. 2

B. 4

C. 7

D. 9

💡 *The mode is the value that appears most often.*

Q94 ★★ Find the range of: 12, 5, 19, 3, 8

A. 7

B. 14

C. 16

D. 19

💡 *Range = Maximum - Minimum.*

Q95 ★★ In a box plot, what does the box represent?

A. Mean and mode

B. The middle 50% of data (IQR)

C. Minimum and maximum

D. Standard deviation

💡 *The box spans from Q1 to Q3.*

Q96 ★★ Which measure of central tendency is MOST affected by outliers?

A. Median

B. Mode

C. Mean

D. Range

💡 *An outlier is an extreme value. Which average gets pulled by it?*

q97 ★★ A scatter plot shows as x increases, y increases. The correlation is:

- A.** Negative
- B.** No correlation
- C.** Positive
- D.** Zero

💡 Both going up together = what kind of relationship?

q98 ★★ ★ What is the IQR of: 2, 5, 7, 9, 11, 14, 18?

- A. 7** **B. 9**
C. 11 **D. 16**

💡 $IQR = Q3 - Q1$. Find the medians of the lower and upper halves.

q99 ★★★★★ The correlation coefficient $r = -0.95$ means:

- A.** No correlation **B.** Weak positive
C. Strong negative **D.** Strong positive

💡 r close to -1 means strong negative; close to $+1$ means strong positive.

Q100 ★★★ The line of best fit for a data set passes through $(0, 3)$ and $(5, 13)$. Its equation is:

- A.** $y = 2x + 3$
B. $y = 3x + 2$
C. $y = 2x + 5$
D. $y = 5x + 3$

 Find slope first, then use one point to find b .



Answer Key

Q01 → B (10)	Q02 → A (-8)	Q03 → B (7)	Q04 → C (Distributive)	Q05 → B (8x)
Q06 → A (11x - 8)	Q07 → B (-2x + 10)	Q08 → B (10)	Q09 → B ({-3, 0, 4, 7})	Q10 → A (2x ² + 6x - 5)
Q11 → A (5)	Q12 → C (6)	Q13 → B (8)	Q14 → B (12)	Q15 → A (3)
Q16 → C (6)	Q17 → B (-3)	Q18 → C (8)	Q19 → A (y = 2x + 3)	Q20 → B (Same slope)
Q21 → B (x > 4)	Q22 → A (x ≤ 5)	Q23 → C (Flip the inequality sign)	Q24 → B (x < -3)	Q25 → A (Open circle at 2, shaded left)
Q26 → B ((-1, 5])	Q27 → A (-2 < x < 8)	Q28 → B (x ≤ -4 or x ≥ 3)	Q29 → A (x - 10 < 3)	Q30 → A (2 < x ≤ 5)
Q31 → C (x = y ²)	Q32 → A (11)	Q33 → C (All real numbers)	Q34 → A (5)	Q35 → C (Absolute value)
Q36 → A (2)	Q37 → B (y = 3x + 1)	Q38 → A (37)	Q39 → B (Negative slope)	Q40 → A (4)
Q41 → C (Intersect)	Q42 → A ((3,6))	Q43 → A ((5,2))	Q44 → C (Parallel)	Q45 → B (Coincident (same line))
Q46 → B ((2,1))	Q47 → A ((14/5, 9/5))	Q48 → A (27)	Q49 → C (Infinitely many solutions)	Q50 → B (No solution)
Q51 → A (x ⁷)	Q52 → B (x ⁶)	Q53 → C (1)	Q54 → A (x ³)	Q55 → C (1/8)
Q56 → B (8x ⁶ y ³)	Q57 → B (4.5 × 10 ⁻⁴)	Q58 → A (x ²)	Q59 → B (8)	Q60 → A (x ³)
Q61 → C (3)	Q62 → A (4x ² - 3x + 4)	Q63 → A (3x ² - 4x + 4)	Q64 → A (6x ² - 15x)	Q65 → A (x ² + 7x + 12)
Q66 → C (x ² - 25)	Q67 → B (x ² + 6x + 9)	Q68 → A (6x ² + 5x - 4)	Q69 → C (Trinomial)	Q70 → A (2x + 3)

Q71 → **B** ($3x(2x + 3)$)

Q76 → **C** ($2x(x + 4)$)

Q81 → **B**
(Parabola)

Q86 → **C** (No
real solutions)

Q91 → **B** (6)

Q96 → **C** (Mean)

Q72 → **A** ($(x + 3)(x + 4)$)

Q77 → **A** ($(x + 5)^2$)

Q82 → **B** ((3,
5))

Q87 → **B** ($x = \pm 2$)

Q92 → **A** (5)

Q97 → **C**
(Positive)

Q73 → **A** ($(x - 2)(x - 3)$)

Q78 → **A** ($(3x + 2)(x + 3)$)

Q83 → **A** ($x = -2, -3$)

Q88 → **A** ($x = -2$)

Q93 → **B** (4)

Q98 → **B** (9)

Q74 → **C** ($(x - 3)(x + 3)$)

Q79 → **A** ($x = 0$
and $x = 4$)

Q84 → **A** ($(-b \pm \sqrt{b^2 - 4ac}) / 2a$)

Q89 → **A** ($x = 3$
(double root))

Q94 → **C** (16)

Q99 → **C** (Strong
negative)

Q75 → **A** ($(x - 5)(x + 3)$)

Q80 → **A** ($x = 2$
and $x = -3$)

Q85 → **A** (-4)

Q90 → **C** ($t = 0$
and $t = 4$)

Q95 → **B** (The
middle 50% of
data (IQR))

Q100 → **A** ($y = 2x + 3$)