

(A) 4 hours

(B) 4 hours 30 min

(C) 5 hours 30 min

(D) 5 hours

Q5 · Percentages

Percent = (part / whole) x 100. Sequential discounts multiply!

A shirt costs \$80. First 25% off, then 10% off the sale price. What is the final price?

Tip: 25% + 10% is NOT 35% off. Apply discounts one at a time!

(A) \$44

(B) \$52

(C) \$54

(D) \$56

Q6 · Slope & Linear Functions

$Slope\ m = (y_2 - y_1) / (x_2 - x_1)$. Change in y divided by change in x .

Taxi A: \$3 flat fee + \$2/mile. Taxi B: \$5/mile, no flat fee. After how many miles do both cost the same?

Tip: Set up two equations and solve where they meet.

- (A) 1 mile (B) 1.5 miles
(C) 2 miles (D) 3 miles

Q7 · Exponents

$a^m \times a^n = a^{(m+n)}$. Same base, add exponents. Doubling is EXPONENTIAL!

A bacteria colony doubles every hour. Starting with 50 bacteria, how many after 4 hours?

Tip: Doubling 4 times is 2^4 , not 2×4 . Think exponentially!

- (A) 200 (B) 400
(C) 500 (D) 800

Q8 · Factoring

For $x^2 + bx + c$: find two numbers that multiply to c AND add to b .

A garden has area $x^2 + 7x + 12$ sq ft. One side is $(x + 3)$ ft. What is the other side?

Tip: Factor the trinomial — don't guess randomly.

- (A) $(x + 2)$ (B) $(x + 6)$
(C) $(x + 4)$ (D) $(x + 9)$

Q9 · Functions

$f(x)$: substitute x carefully. Exponent applies to x only, not $2x$!

$f(x) = 2x^2 - 3$ models a rollercoaster's height. What is $f(3)$?

Tip: $2(3)^2$ is NOT $(2 \times 3)^2$. Square x first, then multiply by 2.

- (A) 9 feet (B) 15 feet
(C) 33 feet (D) 21 feet

Q10 · Quadratic Equations

If $ab = 0$, then $a = 0$ or $b = 0$. Factor first, set each factor to zero!

Ball height: $h = -16t^2 + 48t$. When does the ball hit the ground ($h = 0$)?

Tip: $t = 0$ is the launch, not the landing. Choose the non-zero solution!

- (A) $t = 1$ sec (B) $t = 2$ sec
(C) $t = 3$ sec (D) $t = 4$ sec

Q6 · Similar Triangles

Similar triangles have equal angles AND proportional sides. Set up a proportion!

A tree casts a 15 ft shadow. At the same time, a 6 ft person casts a 4 ft shadow. How tall is the tree?

Tip: Keep the ratio consistent: height/shadow = height/shadow.

- (A) 18 ft (B) 20 ft
(C) 10 ft (D) 22.5 ft

Q7 · Interior Angles of Polygons

Sum of interior angles = $(n-2) \times 180$ degrees, where n = number of sides.

What is the measure of each interior angle of a regular hexagon?

Tip: Find the total sum first, then divide by the number of angles.

- (A) 108 deg (B) 135 deg
(C) 120 deg (D) 144 deg

Q8 · Coordinate Geometry — Distance

NONA GRID

$d = \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$. Same as the Pythagorean theorem!

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

- (A) $\sqrt{7}$ (B) 5
(C) 7 (D) $\sqrt{50}$

Q9 · Surface Area

SA of a box = $2(lw + lh + wh)$. 6 faces in 3 matching pairs. Always multiply by 2!

A gift box is 10 cm x 6 cm x 4 cm. How much wrapping paper is needed?

Tip: Don't forget to count all 6 faces — 3 pairs of 2.

- (A) 248 cm^2 (B) 240 cm^2
(C) 124 cm^2 (D) 480 cm^2

Q10 · Parallel Lines & Transversals

NONA GRID

Co-interior angles ADD to 180. Alternate and corresponding are EQUAL.

Two parallel lines are cut by a transversal. One angle is 65 degrees. What is its co-interior (same-side interior) angle?

Tip: Co-interior angles are SUPPLEMENTARY (sum to 180), not equal!

- (A) 65 deg (B) 25 deg
(C) 115 deg (D) 130 deg

ANSWER KEY

Algebra 1

| # | Topic | Answer |
|----|--------------------------|-----------------------|
| 1 | Linear Equations | (C) 36 |
| 2 | Inequalities | (B) $5 \leq n \leq 7$ |
| 3 | Systems of Equations | (A) \$8 |
| 4 | Proportions & Rates | (D) 5 hours |
| 5 | Percentages | (C) \$54 |
| 6 | Slope & Linear Functions | (A) 1 mile |
| 7 | Exponents | (D) 800 |
| 8 | Factoring | (C) $(x + 4)$ |
| 9 | Functions | (B) 15 feet |
| 10 | Quadratic Equations | (C) $t = 3$ sec |

Geometry

| # | Topic | Answer |
|----|--------------------------------|---------------------------|
| 1 | Pythagorean Theorem | (B) 10 ft |
| 2 | Area of Triangles | (A) 63 m^2 |
| 3 | Circles — Area & Circumference | (D) 153.86 in^2 |
| 4 | Angle Relationships | (B) 133 deg |
| 5 | Volume of Rectangular Prisms | (C) $20,000 \text{ cm}^3$ |
| 6 | Similar Triangles | (D) 22.5 ft |
| 7 | Interior Angles of Polygons | (C) 120 deg |
| 8 | Coordinate Geometry — Distance | (B) 5 |
| 9 | Surface Area | (A) 248 cm^2 |
| 10 | Parallel Lines & Transversals | (C) 115 deg |

Good luck with your studies! ■