

Algebra I & Geometry

Linear Functions · Equations · Inequalities | Triangles · Polygons · Circles

Name: _____

Date: _____

Score: _____ / 20

PART 1 — ALGEBRA I

LINEAR FUNCTIONS · EQUATIONS · INEQUALITIES

Q01 · Linear Function

Which of the following is the slope of the line passing through (2, 5) and (6, 13)?

Hint: $\text{slope} = (y_2 - y_1) / (x_2 - x_1)$

■ QUICK MEMORY: SLOPE = RISE / RUN: subtract y's on top, x's on bottom. Order must match!

A) $m = 1$

B) $m = 2$

C) $m = 3$

D) $m = 4$

Q02 · Slope-Intercept

The equation of a line is $y = -3x + 7$. What is the y-intercept?

Hint: $y = mx + b$ where b is the y-intercept

■ QUICK MEMORY: $y = mx + b \rightarrow b =$ where the line Begins (crosses y-axis)

A) -3

B) 3

C) 7

D) -7

Q03 · Linear Equation

Solve for x: $2x + 9 = 25$

Hint: Isolate x by doing the same operation to both sides

■ QUICK MEMORY: INVERSE OPERATIONS: subtract before dividing. Undo in reverse order!

A) $x = 7$

B) $x = 8$

C) $x = 17$

D) $x = 11.5$

Q04 · Equation

Which value of x satisfies $(x - 3)/2 = (x + 1)/4$?

Hint: Cross-multiply or multiply both sides by the LCD

■ QUICK MEMORY: CROSS-MULTIPLY: $a/b = c/d \rightarrow a \times d = b \times c$

A) $x = 5$

B) $x = 7$

C) $x = 3$

D) $x = -1$

Q05 · Inequality

Solve: $-4x + 3 > 19$. Which of these is the correct solution?

Hint: Remember the key rule when dividing by a negative number!

■ QUICK MEMORY: FLIP THE SIGN when multiplying or dividing both sides by a NEGATIVE!

A) $x > -4$

B) $x > 4$

C) $x < -4$

D) $x < 4$

Q06 · Linear Function

Line l has slope $2/3$ and passes through $(0, -1)$. What is y when $x = 6$?

Hint: Write the equation first using slope-intercept form, then substitute

■ QUICK MEMORY: PLUG-IN: Write equation \rightarrow substitute $x \rightarrow$ calculate y . One step at a time!

A) $y = 2$

B) $y = 3$

C) $y = 4$

D) $y = 5$

Q07 · Systems of Equations

Which point is the solution to the system: $y = 2x - 1$ and $y = -x + 5$?

Hint: Set the two expressions for y equal to each other

■ QUICK MEMORY: SUBSTITUTION: if both = y , set them EQUAL. Solve for x , then find y .

A) $(1, 1)$

B) $(2, 3)$

C) $(3, 2)$

D) $(0, 5)$

Q08 · Inequality

Which inequality represents: 'all numbers between -2 and 5, including 5 but not -2'?

Hint: Open circle = not included; closed circle = included

■ QUICK MEMORY: OPEN (< > -> NOT included. CLOSED [>= <= -> INCLUDED.

A) $-2 \leq x \leq 5$

B) $-2 < x < 5$

C) $-2 \leq x < 5$

D) $-2 < x \leq 5$

Q09 · Linear Function

Line A is $y = 4x - 2$. Line B is perpendicular to A and passes through (8, 1). What is the equation of Line B?

Hint: Perpendicular lines have slopes that are negative reciprocals

■ QUICK MEMORY: PERPENDICULAR slope = FLIP and FLIP SIGN. (e.g. 4 -> -1/4)

A) $y = 4x - 31$

B) $y = -4x + 33$

C) $y = -(1/4)x + 3$

D) $y = (1/4)x - 1$

Q10 · Inequality / Word Problem

Maya earns \$12 per hour. She has already saved \$45 and wants to save at least \$200.

What is the minimum number of whole hours she must work?

Hint: Set up an inequality, then round up if not a whole number

■ QUICK MEMORY: 'AT LEAST' = \geq (greater than or equal). Always ROUND UP for minimum whole hours!

A) 12 hours

B) 12 hours

C) 13 hours

D) 14 hours

Q11 · Triangle

In a triangle, two angles measure 55 degrees and 72 degrees. What is the third angle?

Hint: The sum of angles in any triangle is always 180 degrees

■ QUICK MEMORY: TRIANGLE ANGLES always add to 180 degrees. Missing angle = $180 - (\text{sum of other two})$

A) 43 degrees

B) 47 degrees

C) 53 degrees

D) 63 degrees

Q12 · Triangle / Pythagorean

A right triangle has legs of length 6 and 8. What is the length of the hypotenuse?

Hint: Pythagorean theorem: $a^2 + b^2 = c^2$

■ QUICK MEMORY: PYTHAGOREAN: $a^2 + b^2 = c^2 \rightarrow c = \text{hypotenuse}$ (longest side, opposite right angle)

A) $c = 9$

B) $c = 10$

C) $c = 12$

D) $c = 14$

Q13 · Polygon

What is the sum of the interior angles of a regular hexagon?

Hint: Formula: $(n - 2) \times 180$ degrees, where $n = \text{number of sides}$

■ QUICK MEMORY: INTERIOR ANGLE SUM = $(n - 2) \times 180$. Subtract 2 sides (always!), then multiply by 180.

A) 540 degrees

B) 630 degrees

C) 720 degrees

D) 900 degrees

Q14 · Circle

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

Hint: Circumference $C = 2 \times \pi \times r$

■ QUICK MEMORY: $C = 2 \times \pi \times r$ (circumference uses RADIUS) -- 'Cherry PIE' = $C = \pi \times d!$

A) 21.98 cm

B) 43.96 cm

C) 49.00 cm

D) 153.86 cm

Q15 · Circle

A circle has an area of $100 \times \pi$ cm squared. What is its radius?

Hint: Area formula: $A = \pi \times r^2$. Solve for r .

■ QUICK MEMORY: Area = $\pi \times r^2$ -> divide both sides by π , then SQUARE ROOT to get r .

A) $r = 5$ cm

B) $r = 50$ cm

C) $r = 10$ cm

D) $r = 100$ cm

Q16 · Triangle Congruence

Two triangles have two sides and the included angle equal. Which congruence postulate applies?

Hint: The key word is 'included' -- the angle is between the two known sides

■ QUICK MEMORY: SAS = Side-ANGLE-Side (angle BETWEEN sides). SSA is NOT a valid postulate!

A) SSS

B) SAS

C) ASA

D) AAS

Q17 · Polygon

Each exterior angle of a regular polygon measures 40 degrees. How many sides does it have?

Hint: The sum of all exterior angles of any convex polygon is always 360 degrees

■ QUICK MEMORY: SUM of exterior angles = always 360 degrees. Sides = $360 /$ each exterior angle.

A) 8 sides

B) 9 sides

C) 10 sides

D) 12 sides

Q16	B	Q17	B	Q18	C	Q19	B	Q20	C
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Algebra I: Q01–Q10 | Geometry: Q11–Q20 | Each question = 5 points | Total = 100 points