ALGEBRA 1 & GEOMETRY

Core Problem Set — 20 Essential Questions

Linear Functions · Inequalities · Triangles · Polygons · Circles

Name: _____ Date: _____ Score: _____ / 20

PART 1 — ALGEBRA 1: LINEAR FUNCTIONS & INEQUALITIES (Q 1–10)

Q01. Which equation represents a line with slope -3 passing through the point (2, 4)?

[Memory Point] Key: y - y1 = m(x - x1) [Point-Slope Form]

A) y = -3x + 1

B) y = -3x + 10

C) y = 3x - 2

D) y = -3x - 10

Q02. What is the x-intercept of the line 4x - 2y = 12?

[Memory Point] Key: Set y = 0 to find x-intercept. Set x = 0 to find y-intercept.

A) (6, 0)

B) (0, 3)

C) (3, 0)

D) (0, -6)

Q03. Lines l1 and l2 are perpendicular. If l1 has slope 2/3, what is the slope of l2?

[Memory Point] Key: Perpendicular slopes are negative reciprocals: m2 = -1/m1

A) -3/2

B) 3/2

C) -2/3

D) 2/3

Q04. Solve the compound inequality: -2 <= 3x + 1 <= 10

[Memory Point] Key: Apply the same operation to ALL three parts simultaneously.

A) -1 <= x <= 3

B) -1 < x < 3

C) 1 <= x <= 4

D) -3 <= x <= 3

Q05. A linear function passes through (0, -5) and (4, 7). What is the slope (rate of change)?

[Memory Point] Key: m = (y2 - y1) / (x2 - x1) [Rise over Run]

A) 2

B) 3

C) -3

D) 1/3

Q06. A dashed line has slope 1 and y-intercept -2. The region ABOVE is shaded. Which inequality?

[Memory Point] Key: Above = y > or y >= | Dashed line = strict inequality (> or <)

A) y >= x - 2
B) y < x - 2
C) y > x - 2
D) y <= x - 2

Q07. If f(x) = -2x + 7, what is the value of f(-3)?

[Memory Point] Key: Substitute x = -3. Remember: negative x negative = positive.

A) 13
B) 1
C) -13
D) -1

Q08. Solve: |2x - 4| > 6

[Memory Point] Key: |A| > k splits into A > k OR A < -k (two separate inequalities)

A) -1 < x < 5
B) x > 5
C) x < -1
D) x < -1 or x > 5

Q09. Line 1: y = 4x - 3. Which line is PARALLEL to Line 1?

[Memory Point] Key: Parallel lines have the same slope, different y-intercept.

A) y = -(1/4)x + 1
B) 8x - 2y = 5
C) y = 4x - 3
D) y = 3x + 4

Q10. Solve the inequality: -4x <= 20

[Memory Point] Key: Dividing or multiplying by a NEGATIVE number REVERSES the inequality sign!

A) x <= -5
B) x <= 5
C) x >= -5
D) x > -5

PART 2 — GEOMETRY: TRIANGLES, POLYGONS & CIRCLES (Q 11–20)

Q11. In a triangle, two angles measure 47 degrees and 83 degrees. What is the third angle?

[Memory Point] Key: Triangle Angle Sum = 180 degrees. Third = 180 - (sum of other two)

A) 40 degrees
B) 50 degrees
C) 60 degrees
D) 130 degrees

Q12. In a right triangle with legs a = 6 and b = 8, what is the hypotenuse?

[Memory Point] Key: Pythagorean Theorem: a^2 + b^2 = c^2

A) 10
B) 14
C) 100
D) sqrt(28)

Q13. What is the sum of interior angles of a HEXAGON?

[Memory Point] Key: Interior Angle Sum = (n - 2) x 180 degrees where n = number of sides

A) 540 degrees
B) 900 degrees
C) 720 degrees
D) 1080 degrees

Q14. A circle has radius 7 cm. What is its CIRCUMFERENCE? (Use pi = 3.14)

[Memory Point] Key: Circumference = 2 x pi x r | Area = pi x r^2 (don't mix these up!)

A) 153.86 cm
B) 21.98 cm
C) 43.96 cm^2
D) 43.96 cm

Q15. An exterior angle of a triangle is 115 degrees. One non-adjacent interior angle is 60 degrees. Find the other.

[Memory Point] Key: Exterior Angle Theorem: Exterior angle = sum of two non-adjacent interior angles

A) 65 degrees
B) 55 degrees
C) 175 degrees
D) 25 degrees

Q16. A regular polygon has each interior angle equal to 135 degrees. How many sides?

[Memory Point] Key: Each exterior angle = 180 - 135 = 45 degrees. Then n = 360 / exterior angle

A) 6
B) 9
C) 8
D) 10

Q17. A circle has DIAMETER 10 cm. What is its area? (Use pi = 3.14)

[Memory Point] Key: Diameter to Radius: r = d / 2 FIRST, then use Area = pi x r^2

A) 78.5 cm^2
B) 314 cm^2
C) 31.4 cm^2
D) 157 cm^2

Q18. In triangles ABC and DEF: AB/DE = BC/EF = AC/DF. What is their relationship?

[Memory Point] Key: Congruent (=~) = same shape AND size | Similar (~) = same shape, proportional sides

A) Congruent
B) Equilateral
C) Isosceles
D) Similar

Q19. A chord is 8 cm long. The circle's radius is 5 cm. How far is the chord from the center?

[Memory Point] Key: Perpendicular from center bisects chord. Half-chord = 4, radius = 5 (hypotenuse). Use a^2 + b^2 = c^2

A) 4 cm
B) 3 cm
C) sqrt(41) cm
D) 6 cm

Q20. An inscribed angle intercepts an arc of 140 degrees. What is the inscribed angle?

[Memory Point] Key: Inscribed Angle Theorem: Inscribed angle = 1/2 x intercepted arc

A) 140 degrees
B) 280 degrees
C) 70 degrees
D) 40 degrees

ANSWER KEY

Q01: B	Q02: C	Q03: A	Q04: A	Q05: B
Q06: C	Q07: A	Q08: D	Q09: B	Q10: C
Q11: B	Q12: A	Q13: C	Q14: D	Q15: B
Q16: C	Q17: A	Q18: D	Q19: B	Q20: C