

# Algebra 1 & Geometry

Core Practice · 20 Problems · Self-Study Worksheet

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## PART I — ALGEBRA 1 | Linear Functions · Equations · Inequalities

### Q01. Slope of a Line

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

- A. 2  
B. 4  
C.  $\frac{1}{2}$   
D. 8

★ *Memory Key:*  $\text{slope} = (y_2 - y_1) / (x_2 - x_1)$

### Q02. Slope-Intercept Form

Which equation has slope -3 and y-intercept 7?

- A.  $y = 7x - 3$   
B.  $y = 3x + 7$   
C.  $y = -3x + 7$   
D.  $y = -3x - 7$

★ *Memory Key:*  $y = mx + b$  |  $m = \text{slope}$ ,  $b = \text{y-intercept}$

### Q03. Solving Linear Equations

Solve for x:  $3(x - 4) = 2x + 1$

- A.  $x = 11$   
B.  $x = 13$   
C.  $x = 9$   
D.  $x = 5$

★ *Memory Key:* Distribute → Collect like terms → Isolate x

### Q04. Inequalities — Sign Flip Rule

Solve:  $-2x + 5 > 11$

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

★ *Memory Key:* Divide/Multiply by NEGATIVE → FLIP the inequality sign

### Q05. Parallel Lines

Which line is parallel to  $y = 4x - 2$ ?

- A.  $y = -(1/4)x + 3$   
B.  $y = 4x + 7$   
C.  $y = 2x - 2$   
D.  $y = -4x + 1$

★ *Memory Key:* Parallel = SAME slope, different y-intercept

### Q06. Standard Form to Slope

What is the slope of the line  $3x + 6y = 12$ ?

- A. 3  
B.  $\frac{1}{2}$   
C.  $-\frac{1}{2}$   
D. -3

★ *Memory Key:* Rewrite as  $y = mx + b$  first (solve for y)

**Q07. Compound Inequality**

Solve:  $-1 \leq 2x - 3 < 7$

A.  $1 \leq x < 5$

B.  $-2 \leq x < 4$

C.  $1 \leq x < 4$

D.  $0 \leq x < 5$

★ *Memory Key: Apply same operation to ALL THREE parts simultaneously*

**Q08. Function Notation**

If  $f(x) = 2x + 3$ , what is  $f(-4)$ ?

A. 11

B. -5

C. 5

D. -11

★ *Memory Key:  $f(-4)$  = plug in  $x = -4$  everywhere*

**Q09. Finding the Y-Intercept**

A line passes through (3, -1) with slope 2. What is the y-intercept?

A.  $b = 5$

B.  $b = -7$

C.  $b = 7$

D.  $b = -5$

★ *Memory Key: Use  $y = mx + b$ , plug in the given point and slope*

**Q10. Absolute Value Inequality**

Solve:  $|x - 3| \leq 5$

A.  $x \leq 8$

B.  $-2 \leq x \leq 8$

C.  $x \leq -2$  or  $x \geq 8$

D.  $2 \leq x \leq 8$

★ *Memory Key:  $|A| \leq k$  means  $-k \leq A \leq k$  (sandwich / AND form)*

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**PART II — GEOMETRY | Triangles · Polygons · Circles****Q11. Triangle Angle Sum**

A triangle has angles 47 deg and 83 deg. Find the third angle.

A. 50 deg

B. 40 deg

C. 60 deg

D. 130 deg

★ *Memory Key: Triangle angle sum = 180 deg always*

**Q12. Pythagorean Theorem**

Right triangle legs = 6 and 8. What is the hypotenuse?

A. 7

B. 14

C. 10

D. 100

★ *Memory Key:  $a^2 + b^2 = c^2$  |  $c$  is the hypotenuse (longest side)*

**Q13. Interior Angles of Polygon**

What is the sum of the interior angles of a hexagon (6 sides)?

A. 540 deg

B. 720 deg

C. 900 deg

D. 1080 deg

★ *Memory Key: Sum =  $(n - 2) \times 180$  deg*

**Q14. Circle Circumference**

A circle has diameter 10 cm. What is its circumference? ( $\pi = 3.14$ )

- A. 31.4 cm  
B. 62.8 cm  
C. 15.7 cm  
D. 78.5 cm

★ *Memory Key:*  $C = \pi \cdot d = 2 \cdot \pi \cdot r$

**Q15. Circle Area**

A circle has radius 6. What is its area? (in terms of  $\pi$ )

- A.  $12\pi$   
B.  $36\pi$   
C.  $6\pi$   
D.  $144\pi$

★ *Memory Key:*  $A = \pi \cdot r^2$  | Use **RADIUS**, not diameter

**Q16. Exterior Angle Theorem**

An exterior angle = 115 deg. One non-adjacent interior angle = 60 deg. Find the other.

- A. 55 deg  
B. 65 deg  
C. 175 deg  
D. 120 deg

★ *Memory Key:* Exterior angle = sum of 2 non-adjacent interior angles

**Q17. Similar Triangles**

Two similar triangles have side ratio 2:5. Smaller perimeter = 24. Larger perimeter = ?

- A. 48  
B. 60  
C. 50  
D. 120

★ *Memory Key:* Similar shapes: all linear dimensions scale by the **SAME** ratio

**Q18. Area of Triangle**

A triangle has base 10 cm and height 7 cm. What is its area?

- A.  $70 \text{ cm}^2$   
B.  $35 \text{ cm}^2$   
C.  $17 \text{ cm}^2$   
D.  $140 \text{ cm}^2$

★ *Memory Key:*  $A = (1/2) \times \text{base} \times \text{height}$

**Q19. Arc Length**

Circle radius = 9 cm, central angle = 80 deg. Find arc length. ( $\pi = 3.14$ )

- A. ~12.56 cm  
B. ~25.12 cm  
C. ~6.28 cm  
D. ~50.24 cm

★ *Memory Key:* Arc length =  $(\text{theta}/360) \times 2 \cdot \pi \cdot r$

**Q20. Regular Polygon — Each Interior Angle**

What is each interior angle of a regular octagon (8 sides)?

- A. 120 deg  
B. 135 deg  
C. 144 deg  
D. 160 deg

★ *Memory Key:* Each angle =  $(n-2) \cdot 180 / n$

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**ANSWER KEY**

<b>Q</b>	<b>Ans</b>	<b>Q</b>	<b>Ans</b>	<b>Q</b>	<b>Ans</b>	<b>Q</b>	<b>Ans</b>	<b>Q</b>	<b>Ans</b>
1	A	2	C	3	B	4	B	5	B
6	C	7	A	8	B	9	B	10	B
11	A	12	C	13	B	14	A	15	B
16	A	17	B	18	B	19	A	20	B

Algebra: 1-A 2-C 3-B 4-B 5-B 6-C 7-A 8-B 9-B 10-B | Geometry: 11-A 12-C 13-B 14-A 15-B 16-A 17-B 18-B 19-A 20-B