

Algebra 1 & Geometry

Self-Study Worksheet · Linear Functions · Equations · Inequalities · Triangles · Polygons · Circles

PART 1 · ALGEBRA 1

■ QUICK MEMORY POINTS — ALGEBRA

SLOPE rise/run = $(y_2 - y_1) / (x_2 - x_1)$	Y-INTERCEPT where line crosses y-axis ($x=0$)	FLIP SIGN multiply/divide by negative -> flip < or >
ISOLATE get variable alone on one side	PARALLEL same slope, different y-intercept	

Q01 Algebra | Slope

Key Formula: slope $m = (y_2 - y_1) / (x_2 - x_1)$. Rise over run.

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

A) $m = 1$	B) $m = 2$
C) $m = 4$	D) $m = 1/2$

Q02 Algebra | Slope-Intercept

In $y = mx + b$: $m = \text{slope}$, $b = \text{y-intercept}$.

In $y = -3x + 7$, what is the y-intercept?

A) -3	B) 3
C) 7	D) -7

Q03 Algebra | Solving Equations

ISOLATE: do the same operation to both sides.

Solve for x: $2x + 9 = 3$

A) $x = 6$	B) $x = -3$
C) $x = 3$	D) $x = -6$

Q04 Algebra | Inequalities

FLIP SIGN RULE: divide/multiply by negative -> flip the inequality sign!

Solve: $-4x < 20$

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

Q05 Algebra | Linear Function

Point-slope form: $y - y_1 = m(x - x_1)$

Slope $m = 3$ through (1, 4). Equation in slope-intercept form?

A) $y = 3x + 1$	B) $y = 3x + 4$
C) $y = 3x - 1$	D) $y = x + 3$

Q06 Algebra | Parallel Lines

PARALLEL = SAME SLOPE, different y-intercept.

Which line is parallel to $y = 2x - 5$?

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

Q07 Algebra | Systems of Equations

Substitution: solve one equation, plug into the other.

Solve: $y = x + 2$ and $y = 3x - 4$

A) (2, 4)	B) (1, 3)
C) (3, 5)	D) (4, 8)

Q08 Algebra | Compound Inequality

AND compound: both conditions must be true.

Which value satisfies $-1 \leq x < 4$?

A) $x = 0$	B) $x = 4$
C) $x = -2$	D) $x = 5$

Q09 Algebra | Function Notation

$f(x)$: replace every x with the given number.

If $f(x) = 4x - 6$, what is $f(-2)$?

A) 2	B) -2
C) -14	D) -10

Q10 Algebra | Slope Types

Horizontal line \rightarrow slope = 0. Vertical line \rightarrow slope = undefined.

A line is perfectly horizontal. What is its slope?

A) Undefined	B) 0
C) 1	D) -1

PART 2 - GEOMETRY

■ QUICK MEMORY POINTS — GEOMETRY

TRIANGLE SUM 3 angles always add to 180 degrees	POLYGON SUM $(n-2) \times 180$ degrees for n sides	CIRCUMFERENCE $C = 2(\pi)r$ or $(\pi)d$
AREA CIRCLE $A = (\pi)r^2$	PYTHAGOREAN $a^2 + b^2 = c^2$ (right triangle)	

Q11 Geometry | Triangle Angles

TRIANGLE SUM: 3 angles always add to 180 degrees.

A triangle has angles 55 degrees and 75 degrees. Find the third angle.

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

Q12 Geometry | Pythagorean Theorem

$a^2 + b^2 = c^2$ where c is the hypotenuse.

Right triangle with legs 6 and 8. Find the hypotenuse.

A) 12	B) 14
C) 10	D) 7

Q13 Geometry | Polygon Angle Sum

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

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

A) 540 deg	B) 360 deg
C) 720 deg	D) 1080 deg

Q14 Geometry | Circle Area

$A = (\pi)r^2$. Use RADIUS, not diameter!

Area of circle with radius $r = 5$? ($\pi = 3.14$)

A) 31.4	B) 78.5
C) 314	D) 25

Q15 Geometry | Circumference

$C = 2(\pi)r = (\pi)d$. Given diameter, use $C = (\pi)d$ directly.

Circle with diameter 10 cm. Find circumference. ($\pi = 3.14$)

A) 15.7 cm	B) 62.8 cm
C) 31.4 cm	D) 100 cm

Q16 Geometry | Triangle Types

Equilateral: all 3 sides equal \rightarrow all angles = 60 deg.

Equilateral triangle with perimeter 36 cm. Find one side.

A) 9 cm	B) 12 cm
C) 18 cm	D) 6 cm

Q17 Geometry | Exterior Angle

Exterior angle = sum of 2 non-adjacent interior angles.

Two interior angles are 40 deg and 65 deg. Find the exterior angle at vertex 3.

A) 75 deg	B) 115 deg
C) 105 deg	D) 90 deg

Q18 Geometry | Regular Polygon

Each angle of regular polygon = $(n-2) \times 180 / n$.

Each interior angle of a regular octagon (8 sides)?

A) 120 deg	B) 135 deg
C) 144 deg	D) 150 deg

Q19 Geometry | Circle Sector

Sector area = (angle/360) x (pi)r^2.

Circle r = 6 cm, sector central angle = 90 deg. Find sector area. (pi = 3.14)

A) 113.04 cm ²	B) 56.52 cm ²
C) 18.84 cm ²	D) 28.26 cm ²

Q20 Geometry | Triangle Inequality

a + b > c, a + c > b, b + c > a (all three must hold).

Which set can form a triangle?

A) 3, 4, 7	B) 1, 2, 3
C) 5, 7, 9	D) 2, 3, 5

ANSWER KEY

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

Each question is worth 5 points · Total: 100 points