Algebra 1 & Geometry

Practice Worksheet — Core Problems · Answer Key Included

Section 1 — Algebra 1

MEMORY KEYS · ALGEBRA

ISOLATE → move variables to one side, numbers to the other

DISTRIBUTE → multiply EVERYTHING inside parentheses

BALANCE → whatever you do to one side, do to the other

OPPOSITE → undo operations with their opposite (+ ↔ –, × ↔ ÷)

FOIL → First · Outer · Inner · Last (expand two binomials)

01 Algebra — LINEAR EQUATIONS · ONE-STEP

Sarah has some apples. After giving away 7 apples to her friend, she has 15 left. How many apples did Sarah start with?

■ Common Trap: 'giving away' means subtract — so reverse it by adding back.

(A) 8	**(B)** 22
(C) 105	**(D)** 7

02 Algebra — TWO-STEP EQUATIONS

A taxi charges a flat fee of $3 plus $2 per mile. If Maria paid $11 total, how many miles did she travel?

■ Common Trap: subtract the flat fee FIRST, then divide.

(A) 5.5 miles	**(B)** 7 miles
(C) 4 miles	**(D)** 3 miles

03 Algebra — INEQUALITIES · SIGN RULES

You need at least 60 points to pass. Your current score is 45. Each bonus question is worth 3 points. What is the minimum number of bonus questions you must answer correctly?

■ Common Trap: 'at least' means >=. Dividing by a NEGATIVE flips the inequality sign!

(A) 4	**(B)** 5
(C) 6	**(D)** 3

04 Algebra SYSTEMS OF EQUATIONS

A store sells pens for $2 each and notebooks for $5 each. Jake buys a total of 8 items and spends $25. How many pens did Jake buy?

■ Common Trap: set up TWO equations: p + n = 8 AND 2p + 5n = 25. Solve by substitution.

(A) 2 pens	**(B)** 6 pens
(C) 5 pens	**(D)** 3 pens

05 Algebra PROPORTIONS

A recipe uses 3 cups of flour to make 24 cookies. How many cups of flour are needed to make 40 cookies?

■ Common Trap: set up the proportion: 3/24 = x/40. Cross-multiply: 24x = 120, so x = 5.

(A) 4 cups	**(B)** 5 cups
(C) 6 cups	**(D)** 3.5 cups

06 Algebra EXPONENTS · GROWTH

A bacteria colony doubles every hour. Starting with 1 bacterium, how many will there be after 6 hours? Hint: Use N = 2^t where t = hours.

■ Common Trap: 2 x 6 = 12 is WRONG. 'Doubling' means 2^6 (exponential), not multiplication!

(A) 12	**(B)** 36
(C) 64	**(D)** 32

07 Algebra SLOPE / RATE OF CHANGE

A car rental company charges $50 on day 1 and $170 on day 5. Assuming cost increases linearly, what is the daily charge after the first day?

■ Common Trap: slope = change in cost / change in days = (170-50)/(5-1) = 120/4. Interval is 4, not 5!

(A) $24/day	**(B)** $30/day
(C) $34/day	**(D)** $40/day

08 Algebra FACTORING QUADRATICS

The area of a rectangular garden is x^2 + 7x + 12 sq ft. If the length is (x + 4) ft, what is the width?

■ Common Trap: Factor — find two numbers that multiply to 12 AND add to 7: 3 and 4. Width = (x+3).

(A) (x + 6) ft	**(B)** (x + 3) ft
(C) (x + 2) ft	**(D)** (x + 8) ft

09 Algebra WORD PROBLEMS · AGE

Tom is 3 times as old as his sister Emma. In 6 years, Tom will be twice as old as Emma. How old is Emma now?

■ Common Trap: 'In 6 years' means add 6 to BOTH ages. Equation: 3E + 6 = 2(E + 6). Solve!

(A) 4 years old	**(B)** 8 years old
(C) 6 years old	**(D)** 3 years old

10 Algebra PERCENT CHANGE · SUCCESSIVE

A jacket costs $80. It is 25% off. Then an additional 10% off is taken on the sale price. What is the final price?

■ Common Trap: 25% + 10% is NOT 35% off! Apply each separately: $80 x 0.75 = $60, then x 0.90 = $54.

(A) $52.00	**(B)** $54.00
(C) $56.00	**(D)** $48.00

Section 2 — Geometry

MEMORY KEYS · GEOMETRY
PYTHAGOREAN → $a^2 + b^2 = c^2$ (c = hypotenuse — ALWAYS the longest side!)
TRIANGLE SUM → all 3 angles add up to 180° every single time
STRAIGHT LINE → supplementary angles = 180° · Vertical angles = EQUAL
AREA vs PERIMETER → Area = INSIDE (units²) · Perimeter = AROUND (units)
CIRCLE → Area = πr^2 · Circumference = $2\pi r$ (r = radius, NOT diameter!)

11 Geometry TRIANGLE ANGLE SUM

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

■ Common Trap: all triangles = 180°. Third = 180 - 55 - 72. Subtract BOTH known angles!

(A) 63°	**(B)** 48°
(C) 53°	**(D)** 127°

12 Geometry PYTHAGOREAN THEOREM

A ladder leans against a wall. The base is 6 feet from the wall, and it reaches 8 feet up. How long is the ladder?

■ Common Trap: the LADDER is the hypotenuse (c). $6^2 + 8^2 = 100$, so c = sqrt(100) = 10. Don't add 6+8!

(A) 14 feet	**(B)** 10 feet
(C) 7 feet	**(D)** 12 feet

13 Geometry CIRCLE AREA

A circular pizza has a diameter of 14 inches. What is the area? (Use pi ≈ 3.14)

■ Common Trap: the formula uses RADIUS, not diameter! Radius = 7. Area = 3.14 x 49 = 153.86.

(A) 615.44 in²	**(B)** 43.96 in²
(C) 153.86 in²	**(D)** 87.92 in²

14 Geometry PARALLEL LINES · TRANSVERSAL

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

■ Common Trap: co-interior angles are SUPPLEMENTARY (sum = 180°), NOT equal. 180 - 65 = 115°.

(A) 65°	**(B)** 25°
(C) 115°	**(D)** 90°

15 Geometry PERIMETER · COMPOSITE SHAPES

An L-shaped room has sides: 10 m, 6 m, 4 m, 4 m, 6 m, 10 m. What is the perimeter?

■ Common Trap: L-shapes have 6 sides. Count ALL sides including the inner step edges!

(A) 32 m	**(B)** 40 m
(C) 60 m	**(D)** 36 m

16 Geometry SIMILAR TRIANGLES · SHADOWS

A 6-foot person casts a 4-foot shadow. At the same time, a tree casts a 14-foot shadow. How tall is the tree?

■ Common Trap: proportion: 6/4 = x/14. Cross-multiply: 4x = 84, x = 21. Keep heights on top!

(A) 18 feet	**(B)** 21 feet
(C) 24 feet	**(D)** 12 feet

17 Geometry VOLUME · RECTANGULAR PRISM

A fish tank is 40 cm long, 25 cm wide, 30 cm tall. How many liters does it hold? (1 L = 1,000 cm^3)

■ Common Trap: Volume = 40x25x30 = 30,000 cm^3, then divide by 1,000 for liters. Don't skip conversion!

(A) 3 liters	**(B)** 30,000 liters
(C) 30 liters	**(D)** 300 liters

18 Geometry COORDINATE GEOMETRY · MIDPOINT

Point A is at (2, 3) and Point B is at (8, 11). What is the midpoint of segment AB?

■ Common Trap: Midpoint = ((x1+x2)/2, (y1+y2)/2). ADD the coordinates, then divide. Don't subtract!

(A) (3, 4)	**(B)** (6, 8)
(C) (5, 7)	**(D)** (4, 6)

19 Geometry AREA · TRAPEZOID

A trapezoidal garden has parallel sides of 8 m and 12 m, with a height of 5 m. What is the area?

■ Common Trap: Area = (1/2)(b1+b2)xh. The 1/2 is essential! = 1/2 x 20 x 5 = 50 m^2.

(A) 100 m^2	**(B)** 50 m^2
(C) 40 m^2	**(D)** 60 m^2

20 Geometry INTERIOR ANGLES · POLYGONS

What is the sum of all interior angles of a hexagon (6-sided polygon)?

■ Common Trap: Formula = (n-2) x 180°. For hexagon: (6-2) x 180 = 4 x 180 = 720°. Use (n-2), not n!

(A) 540°	**(B)** 1080°
(C) 720°	**(D)** 900°

Answer Key

ALGEBRA 1

Q01	B – 22	**Q06**	C – 64
Q02	C – 4 miles	**Q07**	B – $30/day
Q03	B – 5	**Q08**	B – (x+3) ft
Q04	C – 5 pens	**Q09**	C – 6 yrs
Q05	B – 5 cups	**Q10**	B – $54.00

GEOMETRY

Q11	C – 53°	**Q16**	B – 21 ft
Q12	B – 10 ft	**Q17**	C – 30 L
Q13	C – 153.86 in²	**Q18**	C – (5,7)
Q14	C – 115°	**Q19**	B – 50 m²
Q15	B – 40 m	**Q20**	C – 720°

Score: _____ / 20 Algebra: _____ / 10 Geometry: _____ / 10