

Math Practice Workbook

Pre-Algebra & Geometry

20 Essential Problems · Core Topics · Self-Study Edition

Answer Key included at the end of each section

Section 1 — Pre-Algebra

Order of Operations · Equations · Negatives · Fractions · Exponents · Ratios · Percent · Slope

01 ★ ORDER OF OPERATIONS

Evaluate: $3 + 4 \times 2 - 1$

■ Warning: do NOT add 3+4 first!

Memory tip: PEMDAS: Multiply / Divide before Add / Subtract.

A) 13	B) 10
C) 14	D) 12

02 ★ SOLVING EQUATIONS

Solve for x: $2x + 5 = 13$

Memory tip: UNDO: subtract 5 first, then divide by 2.

A) $x = 3$	B) $x = 4$
C) $x = 9$	D) $x = 6$

03 ★ NEGATIVE NUMBERS

What is $(-3) \times (-4) + (-2)$?

■ Warning: double negative becomes positive!

Memory tip: SAME SIGN = positive | DIFFERENT SIGN = negative

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

04 ★ FRACTIONS — LCD

Simplify: $\frac{3}{4} + \frac{1}{6}$

Memory tip: LCD: find Least Common Denominator. $\text{LCD}(4,6) = 12$.

A) $\frac{4}{10}$	B) $\frac{2}{5}$
C) $\frac{11}{12}$	D) $\frac{5}{12}$

05 ★ DISTRIBUTIVE PROPERTY

Expand: $3(x - 4) + 2x$

Memory tip: DISTRIBUTE: multiply outside number by every term inside brackets.

A) $5x - 4$	B) $5x - 12$
C) $3x - 12$	D) $5x + 12$

06 ★ RATIO & PROPORTION

A car travels 120 miles in 2 hours. How far does it travel in 5 hours?

Memory tip: UNIT RATE: find miles per 1 hour first, then multiply.

A) 240 miles	B) 280 miles
C) 300 miles	D) 360 miles

07 ★ EXPONENTS

What is $2^3 \times 2^2$?

■ Warning: same base — ADD the exponents, don't multiply!

Memory tip: SAME BASE: $a^m \times a^n = a^{(m+n)}$

A) $4^6 = 64$	B) $2^6 = 64$
C) $2^5 = 32$	D) 10

08 ★ PERCENT

A \$80 jacket is 25% off. What is the sale price?

Memory tip: PERCENT OFF: $\text{price} \times (1 - \text{rate}) \Rightarrow \80×0.75

A) \$55	B) \$60
C) \$65	D) \$20

09 ★ INEQUALITIES

Solve: $-2x > 8$

■ Warning: dividing by a NEGATIVE number FLIPS the inequality!

Memory tip: FLIP: dividing/multiplying by negative \Rightarrow $>$ becomes $<$

A) $x > -4$	B) $x < -4$
C) $x > 4$	D) $x < 4$

10 ★ SLOPE

Find the slope through points (2, 3) and (6, 11).

Memory tip: RISE over RUN: slope = $(y_2 - y_1) / (x_2 - x_1)$

A) 1	B) 3
C) 2	D) 4

ANSWER KEY

01 B) 10

02 B) $x = 4$

03 C) 10

04 C) $11/12$

05 B) $5x - 12$

06 C) 300 miles

07 C) $2^5 = 32$

08 B) \$60

09 B) $x < -4$

10 C) 2

Section 2 — Geometry

Angles · Pythagorean Theorem · Area · Volume · Circles · Similar Figures

G1 ★ SUPPLEMENTARY ANGLES

Two angles are supplementary. One angle = 65° . What is the other?

■ Warning: supplementary = 180 degrees, NOT 90 degrees!

Memory tip: S for Straight (180°) | C for Corner (complementary = 90°)

A) 25°	B) 35°
C) 115°	D) 125°

G2 ★ PYTHAGOREAN THEOREM

A right triangle has legs 3 and 4. Find the hypotenuse.

Memory tip: $a^2 + b^2 = c^2$ Memorize: 3-4-5 triple!

A) 6	B) 5
C) 7	D) $\sqrt{7}$

G3 ★ AREA OF TRIANGLE

A triangle has base = 10 cm and height = 6 cm. Find the area.

Memory tip: Area = $(1/2) \times \text{base} \times \text{height}$ — a triangle is HALF a rectangle!

A) 60 cm ²	B) 30 cm ²
C) 16 cm ²	D) 32 cm ²

G4 ★ CIRCLE AREA

A circle has diameter = 10 cm. Find its area. ($\pi = 3.14$)

■ Warning: diameter is NOT the radius! Divide by 2 first.

Memory tip: Area = $\pi \times r^2$ and $r = \text{diameter} / 2$

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

G5 ★ VERTICAL ANGLES

Two lines intersect. One angle = 70°. What is the adjacent angle?

■ Warning: adjacent does NOT equal vertical!

Memory tip: VERTICAL = EQUAL | ADJACENT + angle = 180°

A) 70°	B) 110°
C) 90°	D) 20°

G6 ★ TRIANGLE ANGLE SUM

A triangle has angles 45° and 85°. Find the third angle.

Memory tip: TRIANGLE SUM = 180° — always, no exceptions.

A) 40°	B) 50°
C) 60°	D) 130°

G7 ★ PERIMETER vs AREA

Rectangle: 8 cm x 5 cm. A student says perimeter = 40 cm. Correct?

■ Warning: most confused formulas — Perimeter vs. Area!

Memory tip: PERIMETER = $2(l+w)$ = fence | AREA = $l \times w$ = floor

A) Yes, 40 cm	B) No, P = 26 cm
C) No, P = 13 cm	D) No, P = 30 cm

G8 ★ SIMILAR TRIANGLES

Two similar triangles have sides in ratio 1:3. Smaller area = 4 cm². Find larger area.

■ Warning: area scales by the SQUARE of the ratio!

Memory tip: Side ratio 1:3 => Area ratio $1^2 : 3^2 = 1:9$

A) 12 cm ²	B) 36 cm ²
C) 16 cm ²	D) 9 cm ²

G9 ★ VOLUME OF RECTANGULAR PRISM

A box is 5 cm x 4 cm x 3 cm. What is its volume?

Memory tip: $V = l \times w \times h$ — stack h layers of (l x w) base

A) 47 cm ³	B) 94 cm ³
C) 60 cm ³	D) 20 cm ³

G10 ★ CIRCUMFERENCE

A wheel has radius = 7 cm. How far does it travel in 1 full rotation? ($\pi = 3.14$)

■ Warning: rotation = circumference, NOT area!

Memory tip: $C = 2 \times \pi \times r$ — the distance around the circle.

A) 153.86 cm	B) 21.98 cm
C) 43.96 cm	D) 87.92 cm

ANSWER KEY

G1 C) 115°

G2 B) 5

G3 B) 30 cm²

G4 B) 78.5 cm²

G5 B) 110°

G6 B) 50°

G7 B) No, P = 26 cm

G8 B) 36 cm²

G9 C) 60 cm^3

G10 C) 43.96 cm

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