Math Mastery

Pre-Algebra · Geometry — Print Worksheet

PART 1 · Pre-Algebra

Q1 — ORDER OF OPERATIONS · PEMDAS

Evaluate: 3 + 4 × 2 – (6 ÷ 3)

■ *Please Excuse My Dear Aunt Sally → Parentheses · Exponents · ×÷ · +–*

A. 7

B. 9

C. 12

D. 5

Q2 — INTEGER OPERATIONS · NEGATIVES

What is the value of –3 × (–4) + (–5) ?

■ *neg × neg = pos | neg × pos = neg → Same signs: +, Different: –*

A. –17

B. 17

C. 7

D. –7

Q3 — FRACTIONS · ADDING UNLIKE DENOMINATORS

Simplify: 2/3 + 5/6

■ *LCD → Convert → Add → Simplify → Find Least Common Denominator first*

A. 1 and 1/2

B. 7/9

C. 7/6

D. 2

Q4 — SOLVING ONE-STEP EQUATIONS

If 5x – 3 = 22, what is the value of x?

■ *ISOLATE → INVERSE OPERATIONS → Undo +/– first, then ×/÷*

A. x = 4

B. x = 5

C. x = 19

D. x = 3.8

Q5 — RATIOS & PROPORTIONS

A car travels 180 miles in 3 hours. At the same rate, how many miles in 5 hours?

■ *UNIT RATE × TIME = DISTANCE → Find rate per 1 unit, then scale up*

A. 240 miles
B. 280 miles
C. 270 miles
D. 300 miles

Q6 — PERCENT · INCREASE & DECREASE

A shirt costs $40. It is on sale for 25% off. What is the sale price?

■ *Sale Price = Original × (1 – rate) → 25% off means you pay 75%*

A. $10
B. $25
C. $30
D. $35

Q7 — EXPONENTS · POWERS

Which of the following is equal to 2^3 × 2^4 ?

■ *SAME BASE → ADD exponents → a^m × a^n = a^(m+n)*

A. 2^12
B. 2^7
C. 4^7
D. 2^6

Q8 — INEQUALITIES

Solve: –2x + 4 < 10. Which values make this true?

■ *FLIP the sign when dividing/multiplying by NEGATIVE*

A. x > –3
B. x < –3
C. x > 3
D. x < 7

Q9 — DISTRIBUTIVE PROPERTY

Expand and simplify: 3(x + 4) – 2(x – 1)

■ *DISTRIBUTE → COMBINE like terms → Multiply each term inside by factor outside*

A. x + 14
B. x + 10
C. x + 14
D. 5x + 10

Q10 — WORD PROBLEM · SETTING UP AN EQUATION

Maria has twice as many stickers as Jake. Together they have 42. How many does Maria have?

■ *Let x = smaller → define others in terms of x → write equation from total*

A. 14

B. 21

C. 24

D. 28

PART 2 · Geometry

Q11 — ANGLES · COMPLEMENTARY & SUPPLEMENTARY

Two angles are supplementary. One measures 73°. What is the other?

■ *Complementary = 90° | Supplementary = 180° → 'S' for Straight line*

A. 17°

B. 107°

C. 27°

D. 127°

Q12 — TRIANGLES · INTERIOR ANGLE SUM

A triangle has angles of 47° and 68°. What is the third angle?

■ *Triangle Angle Sum = 180° → Always. Third = 180 – (sum of other two)*

A. 55°

B. 60°

C. 65°

D. 75°

Q13 — PYTHAGOREAN THEOREM

A right triangle has legs of 6 and 8. What is the hypotenuse?

■ *a^2 + b^2 = c^2 (c = hypotenuse) → Know the 3-4-5 and 6-8-10 triples!*

A. 10

B. 12

C. 14

D. √100

Q14 — AREA OF A TRIANGLE

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

■ *A = (1/2) × base × height → Don't forget the 1/2 !*

A. 70 cm²

B. 35 cm²

C. 17 cm²

D. 140 cm²

Q15 — CIRCLES · CIRCUMFERENCE

A circle has diameter 14 cm. What is its circumference? (π ≈ 3.14)

■ *C = πd OR C = 2πr → Diameter = 2 × radius. Don't double-count!*

A. 21.98 cm

B. 87.92 cm

C. 43.96 cm

D. 153.86 cm²

Q16 — AREA OF A CIRCLE

What is the area of a circle with radius 5 m? (π ≈ 3.14)

■ *A = πr² ← square the RADIUS, not the diameter*

A. 78.5 m²

B. 31.4 m²

C. 314 m²

D. 15.7 m²

Q17 — PARALLEL LINES & TRANSVERSALS

Two parallel lines are cut by a transversal. One angle = 115°. What is its alternate interior angle?

■ *Alternate Interior = EQUAL | Co-interior = 180° → 'Z' shape = equal*

A. 65°

B. 75°

C. 115°

D. 180°

Q18 — VOLUME OF A RECTANGULAR PRISM

A box has length 8 cm, width 5 cm, height 4 cm. What is its volume?

■ *V = l × w × h (All three dimensions!) → Volume is 3D*

A. 40 cm³

B. 160 cm³

C. 80 cm³

D. 200 cm³

Q19 — SIMILARITY · SCALE FACTOR

Similar triangles: sides 4 cm and 10 cm. Smaller perimeter = 18 cm. Larger perimeter?

■ *Similar → sides PROPORTIONAL → perimeters proportional too*

A. 36 cm

B. 40 cm

C. 32 cm

D. 45 cm

Q20 — COORDINATE GEOMETRY · DISTANCE FORMULA

Distance between A(1, 2) and B(4, 6)?

■ *$d = \sqrt{[(x2–x1)^2 + (y2–y1)^2]}$ → It's the Pythagorean theorem in disguise!*

A. 3

B. 5

C. 7

D. √25

ANSWER KEY & EXPLANATIONS

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

Q1 B — Parentheses: (6÷3)=2. Multiply: 4×2=8. Then: 3+8–2 = 9.

Q2 C — (–3)×(–4) = +12 (negative × negative = positive). 12+(–5) = 7.

Q3 A — LCD=6. Convert: 2/3=4/6. Add: 4/6+5/6=9/6=1½.

Q4 B — Add 3: 5x=25. Divide by 5: x=5. Check: 5(5)–3=22 ✓

Q5 D — Unit rate: 180÷3=60 mph. In 5 hours: 60×5=300 miles.

Q6 C — Discount: 40×0.25=$10. Sale price: 40–10=$30. Shortcut: 40×0.75=$30.

Q7 B — Same base (2): add exponents 3+4=7. Answer: 2^7=128.

Q8 A — Subtract 4: –2x<6. Divide by –2 and FLIP: x > –3.

Q9 A — 3(x+4)=3x+12. –2(x–1)=–2x+2. Combine: x+14.

Q10 D — Jake=x, Maria=2x. x+2x=42 → x=14 (Jake). Maria=2×14=28.

Q11 B — Supplementary → sum = 180°. 180–73=107°.

Q12 C — 47+68=115. Third: 180–115=65°. Check: 47+68+65=180 ✓

Q13 A — 6^2+8^2=36+64=100. c=√100=10.

Q14 B — A = 1/2 × 10 × 7 = 1/2 × 70 = 35 cm².

Q15 C — $C = \pi \times d = 3.14 \times 14 = 43.96$ cm.

Q16 A — $A = \pi \times r^2 = 3.14 \times 5^2 = 3.14 \times 25 = 78.5$ m².

Q17 C — Alternate interior angles are EQUAL when lines are parallel. Answer: 115°.

Q18 B — $V = 8 \times 5 \times 4 = 160$ cm³.

Q19 D — Scale factor: $10 \div 4 = 2.5$. Larger perimeter: $18 \times 2.5 = 45$ cm.

Q20 B — $\Delta x = 4 - 1 = 3$, $\Delta y = 6 - 2 = 4$. $d = \sqrt{(9+16)} = \sqrt{25} = 5$.