Pre-Algebra & Geometry

Essential 20-Question Exam Practice

Name: _____ Date: _____ Score: _____ / 20

Instructions: Circle the best answer for each question. Each numbered question contains 3 parts (Step 1, 2, 3). You must answer ALL three steps to receive full credit for that question.

SECTION A — PRE-ALGEBRA (Questions 1–10)

Q1. Order of Operations (PEMDAS)

Step 1: What is 2 + 3 × 4?

A) 20
B) 14
C) 12
D) 9

Step 2: What is (5 + 3) × 2 – 4?

A) 12
B) 10
C) 8
D) 6

Step 3: What is 18 ÷ 3^2 + 1?

A) 3
B) 5
C) 7
D) 2

Q2. Solving One-Step Equations

Step 1: Solve: x + 9 = 15

A) x = 4
B) x = 6
C) x = 24
D) x = 7

Step 2: Solve: 4x = 28

A) x = 6
B) x = 32
C) x = 7
D) x = 8

Step 3: Solve: x – 5 = 11

A) x = 6
B) x = 14
C) x = 16
D) x = 55

Q3. Solving Two-Step Equations

Step 1: Solve: 2x + 5 = 13

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

Step 2: Solve: 3x – 6 = 9

A) x = 1
B) x = 3
C) x = 5
D) x = 6

Step 3: Solve: x/2 + 4 = 10

A) x = 3
B) x = 7
C) x = 28
D) x = 12

Q4. Ratios & Proportions

Step 1: Solve the proportion: 2/5 = x/15

A) x = 3
B) x = 6
C) x = 8
D) x = 10

Step 2: If 3 apples cost $1.50, how much do 8 apples cost?

A) $2.50
B) $4.00
C) $3.50
D) $5.00

Step 3: Solve: 7/x = 14/10

A) x = 2
B) x = 5
C) x = 7
D) x = 20

Q5. Percentages

Step 1: What is 25% of 200?

A) 25
B) 50
C) 75
D) 100

Step 2: A shirt costs $40. It is on sale for 15% off. What is the sale price?

A) $25
B) $34
C) $36
D) $38

Step 3: A price increased from $50 to $65. What is the percent increase?

A) 15%
B) 20%
C) 25%
D) 30%

Q6. Negative Numbers & Absolute Value

Step 1: What is |–12| – |4|?

A) –8
B) 8
C) –16
D) 16

Step 2: What is (–6) × (–3) + (–4)?

A) –22
B) 14
C) 22
D) –14

Step 3: Which is largest: |–10|, |7|, or –|8|?

A) |7|
B) –|8|
C) |–10|
D) Equal

Q7. Exponents & Scientific Notation

Step 1: What is $2^3 \times 2^2$?

A) 2■ = 32
B) 2■ = 64
C) 4■
D) $2^1 = 2$

Step 2: Write 0.0067 in scientific notation.

A) 6.7 × 10■²
B) 6.7 × 10■³
C) 67 × 10■■
D) 0.67 × 10■²

Step 3: What is $(3^2)^3$?

A) 3■ = 243
B) 3■ = 729
C) $9^3 = 729$
D) Both B and C

Q8. Slope & Linear Equations

Step 1: Find the slope between points (0,1) and (4,9).

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

Step 2: In y = 3x – 5, what is the y-intercept?

A) 3
B) 5
C) –5
D) –3

Step 3: Which equation has slope = –2 and y-intercept = 4?

A) y = 4x – 2
B) y = –2x + 4
C) y = 2x – 4
D) y = –4x + 2

Q9. Inequalities

Step 1: Solve: $x + 4 > 10$

A) $x > 6$
B) $x > 14$
C) $x < 6$
D) $x < 14$

Step 2: Solve: $-4x \leq 20$

A) $x \leq -5$
B) $x \geq -5$
C) $x \leq 5$
D) $x \geq 5$

Step 3: Which number is NOT a solution to $2x - 1 < 7$?

A) $x = 0$
B) $x = 3$
C) $x = 4$
D) $x = -2$

Q10. Statistics: Mean, Median, Mode

Step 1: Find the mean of: 4, 8, 6, 10, 2

A) 5
B) 6
C) 7
D) 8

Step 2: Find the median of: 5, 2, 9, 1, 7

A) 2
B) 5
C) 7
D) 4.8

Step 3: Which measure is most affected by an extreme outlier?

A) Mode
B) Median
C) Mean
D) Range

SECTION B — GEOMETRY (Questions 11–20)

Q11. Area & Perimeter of Rectangles

Step 1: A rectangle has length 12 and width 4. What is the area?

A) 16 units²
B) 32 units²
C) 48 units²
D) 64 units²

Step 2: A rectangle has area 54 and width 6. What is its length?

A) 7
B) 8
C) 9
D) 10

Step 3: A room is 10m × 7m. If tiles cost $3/m², how much to tile the floor?

A) $51
B) $102
C) $210
D) $70

Q12. Area of Triangles

Step 1: A triangle has base 14 and height 5. What is its area?

A) 19
B) 35
C) 70
D) 40

Step 2: A right triangle has legs 6 and 8. What is its area?

A) 14
B) 24
C) 48
D) 28

Step 3: A triangle has area 45 and height 9. Find the base.

A) 5
B) 10
C) 15
D) 20

Q13. Circles: Circumference & Area

Step 1: A circle has radius 7. Find circumference. (Use $\pi \approx 3.14$)

A) 43.96 units
B) 21.98 units
C) 153.86 units
D) 14π units

Step 2: A circle has diameter 10. Find its area. (Use $\pi \approx 3.14$)

A) 31.4
B) 78.5
C) 314
D) 62.8

Step 3: A wheel has circumference 62.8 cm. Find its radius. ($\pi \approx 3.14$)

A) 5 cm
B) 10 cm
C) 20 cm
D) 31.4 cm

Q14. Pythagorean Theorem

Step 1: A right triangle has legs 5 and 12. Find the hypotenuse.

A) 13
B) 15
C) 17
D) 11

Step 2: A ladder 10m leans against a wall. Base is 6m away. How high does it reach?

A) 4 m
B) 6 m
C) 8 m
D) 9 m

Step 3: Which is a Pythagorean triple?

A) 4, 5, 6
B) 6, 8, 10
C) 5, 7, 9
D) 3, 4, 6

Q15. Angles: Types & Relationships

Step 1: Two angles are supplementary. One is 72°. What is the other?

A) 18°
B) 28°
C) 108°
D) 118°

Step 2: Two angles are complementary. One is 34°. What is the other?

A) 56°
B) 46°
C) 66°
D) 146°

Step 3: Two lines cross: angles are x°, 3x°, x°, 3x°. Find x.

A) 30°
B) 45°
C) 60°
D) 90°

Q16. Triangle Angle Sum

Step 1: A triangle has angles 45° and 65°. What is the third angle?

A) 60°
B) 70°
C) 80°
D) 90°

Step 2: In an isosceles triangle, the vertex angle is 40°. What are the base angles?

A) 60° each
B) 70° each
C) 80° each
D) 140° each

Step 3: Can a triangle have angles 30°, 60°, and 100°?

A) Yes
B) No
C) Only in geometry
D) Need more info

Q17. Volume of 3D Shapes

Step 1: A box is 6cm × 4cm × 3cm. What is its volume?

A) 36 cm^3
B) 52 cm^3
C) 72 cm^3
D) 108 cm^3

Step 2: A cylinder has radius 3 and height 10. Find its volume. ($\pi \approx 3.14$)

A) 94.2 $units^3$
B) 188.4 $units^3$
C) 282.6 $units^3$
D) 942 $units^3$

Step 3: A rectangular prism has volume 120 cm^3. l=5, w=4. Find h.

A) 4 cm
B) 5 cm
C) 6 cm
D) 8 cm

Q18. Coordinate Geometry: Distance & Midpoint

Step 1: Find the distance between (0,0) and (3,4).

A) 3
B) 4
C) 5
D) 7

Step 2: Find the midpoint of (2,4) and (8,10).

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

Step 3: M(3,5) is the midpoint of AB. A = (1,3). Find B.

A) (5,7)
B) (4,8)
C) (2,4)
D) (7,9)

Q19. Similar Triangles & Scale Factor

Step 1: Two similar triangles: corresponding sides are 5 and 15. Scale factor?

A) 2
B) 3
C) 5
D) 10

Step 2: Triangle A has sides 3,5,7. Similar triangle B has smallest side 9. Find longest side.

A) 15
B) 18
C) 21
D) 24

Step 3: Two similar triangles have areas 16 and 36. What is the scale factor of sides?

A) 2:3
B) 4:6
C) 4:9
D) 1:4

Q20. Transformations

Step 1: Point P(4,–2) is reflected over the x-axis. New coordinates?

A) (–4,2)
B) (4,2)
C) (–4,–2)
D) (2,4)

Step 2: Point A(2,5) is translated by (–3, +1). New location?

A) (5,4)
B) (–1,6)
C) (1,6)
D) (–1,4)

Step 3: Point Q(3,4) is rotated 90° counterclockwise. Where does it go?

A) (4,3)
B) (–4,3)
C) (4,–3)
D) (–3,4)

ANSWER KEY

Q#	Topic	Step 1	Step 2	Step 3
1	Order of Operations (PEMDAS)	B	A	A
2	Solving One-Step Equations	B	C	C
3	Solving Two-Step Equations	A	C	D
4	Ratios & Proportions	B	B	B
5	Percentages	B	B	D
6	Negative Numbers & Absolute Value	B	B	C
7	Exponents & Scientific Notation	A	B	D
8	Slope & Linear Equations	B	C	B
9	Inequalities	A	B	C
10	Statistics: Mean, Median, Mode	B	B	C
11	Area & Perimeter of Rectangles	C	C	C
12	Area of Triangles	B	B	B
13	Circles: Circumference & Area	A	B	B
14	Pythagorean Theorem	A	C	B
15	Angles: Types & Relationships	C	A	B
16	Triangle Angle Sum	B	B	B
17	Volume of 3D Shapes	C	C	C
18	Coordinate Geometry: Distance & Midpoi	C	A	A
19	Similar Triangles & Scale Factor	B	C	A
20	Transformations	B	B	B