Pre-Test Algebra

Instructions: Solve each problem. Show your work where possible. Write answers clearly.

1. Classify the number –12: Is it a natural number, whole number, integer, or rational number? Give one example of a number that is an integer but not a whole number.

2. Compute: –15 + 9 – (–7) + 3.

3. A bank account balance is –$85. A deposit of $120 is made. What is the new balance?

4. Translate into a mathematical expression: “Eight less than twice a number.”

5. Round 47.368 to the nearest hundredth.

6. List the first four multiples of 9 and all the positive factors of 36.

7. Find the greatest common factor (GCF) of 48 and 72, and the least common multiple (LCM) of 12 and 18.

8. A package of 24 cookies is shared equally among 8 friends. How many cookies does each friend get? (Use factors or multiples to explain.)

9. Simplify the fraction 24/36 to lowest terms.

10. Convert the mixed number 4 3/5 to an improper fraction and convert 19/4 back to a mixed number.

11. Multiply: 2 1/2 × 3 3/4.

12. Divide: 5/6 ÷ 3/4.

13. Multiply 4 × (3/8) and then divide the result by 2.

14. Add: 2/5 + 3/5.

15. Add: 1/2 + 1/3 (different denominators).

16. Write the ratio of 15 boys to 25 girls in simplest form.

17. Are the ratios 4/6 and 6/9 equivalent? Explain.

18. Solve the proportion: 3/8 = x/24.

19. Write the decimal 0.75 as a fraction in simplest form.

20. Multiply: 2.34×1.6.

21. Divide: $4.8 \div 0.3$.

22. Add: $3.67 + 2.85$.

23. Subtract: $5.2 - 3.75$.

24. If $x = 7$, evaluate the expression $3x + 5$.

25. Explain what the equals sign means in the equation $2x + 3 = 11$.

26. Solve: $x + 8 = 12$.

27. Solve: $5x = 35$.

28. Solve: $2x + 7 = 19$.

29. Convert 3/4 to a percent and 40% to a decimal.

30. A $80 item is on sale for 25% off. What is the discount amount and the sale price?

31. Translate: “30% of a number is 21.” Write the equation.

32. Simplify: $3^2 \times 2^3$.

33. Find the square root of 64 and the cube root of 27.

34. Is $\sqrt{2}$ rational or irrational? Explain briefly.

35. Write 450,000 in scientific notation.

36. Simplify using order of operations: $12 + 3 \times (8 - 5)^2$.

37. Simplify: $24 \div 3 + 2^3 \times (5 - 2)$.

38. Graph the inequality $x > -2$ on a number line (describe the graph) and solve the two-step inequality $2x + 3 \leq 11$.

Answer Key for Post-Test (with solutions)

1. –12 is an integer and rational; not natural or whole. Example: –5.
2. –15 + 9 = –6; –6 – (–7) = 1; 1 + 3 = 4.
3. –85 + 120 = 35.
4. 2n – 8.
5. 47.37.
6. Multiples of 9: 9, 18, 27, 36. Factors of 36: 1, 2, 3, 4, 6, 9, 12, 18, 36.
7. GCF(48, 72) = 24; LCM(12, 18) = 36.
8. 24 ÷ 8 = 3 cookies each (24 is multiple of 8).
9. 2/3.
10. 23/5; 4 3/4.
11. (5/2) × (15/4) = 75/8 = 9 3/8.
12. (5/6) × (4/3) = 20/18 = 10/9.
13. 4 × (3/8) = 12/8 = 3/2; 3/2 ÷ 2 = 3/4.
14. 5/5 = 1.
15. 3/6 + 2/6 = 5/6.
16. 3/5.
17. Yes (both simplify to 2/3).
18. x = 9.
19. 3/4.
20. 3.744.
21. 16.
22. 6.52.
23. 1.45.
24. 26.
25. It separates the two equal expressions or shows balance.
26. x = 4.
27. x = 7.
28. 2x = 12 → x = 6.
29. 75%; 0.40.
30. Discount = $20; sale price = $60.
31. 0.3n = 21.
32. 9 × 8 = 72.
33. $\sqrt{64} = 8$; $\sqrt[3]{27} = 3$.
34. Irrational (cannot be written as fraction of integers).
35. 4.5×10^5.
36. 12 + 3 × 9 = 12 + 27 = 39.
37. 8 + 8 × 3 = 8 + 24 = 32.
38. Open circle at –2 with arrow right; 2x ≤ 8 → x ≤ 4.