Solving Linear Equations

Name: _____ **Date:** _____

Directions: Solve each equation. Show each inverse operation and check your answer when possible.

Part A: One-Step Equations

Use one inverse operation and write the solution clearly.

1. $x + 9 = 17$

2. $y - 12 = -5$

3. $6a = 42$

4. $\frac{b}{5} = -3$

5. $-4m = 28$

6. $n + \frac{3}{4} = 2$

7. $\frac{p}{-6} = 4$

8. $2.5 + q = 7.1$

9. $r - (-8) = 3$

10. $\frac{3}{5}s = 12$

Part B: Two-Step Equations

Undo addition or subtraction first, then multiplication or division.

11. $3x + 5 = 26$

12. $8 - 2y = 20$

13. $\frac{a}{4} - 7 = 2$

14. $5b - 9 = -34$

15. $-3m + 4 = 19$

16. $0.6n + 1.8 = 6$

17. $\frac{2}{3}p - 5 = 9$

18. $14 - \frac{q}{3} = 8$

19. $5 - 7r = -30$

20. $4.5 + 1.5s = -3$

Part C: Multi-Step Equations

Distribute, combine like terms, and collect the variable terms on one side.

21. $4(x - 3) = 2x + 10$

22. $3(2y + 5) - 4 = 5y + 8$

23. $7 - 2(3a - 1) = 4a + 19$

24. $\frac{m-2}{3} + \frac{m+1}{2} = 5$

25. $0.4(5n - 10) = 3(n + 2)$

26. $5(2p - 1) - 3(p + 4) = 4p + 11$

27. $6 - 2(2q + 3) = 4 - (q - 5)$

Part D: Write and Solve

Define a variable, write an equation, solve, and answer in a complete sentence.

28. A phone plan costs \$18 per month plus \$7 for each gigabyte of data used. The bill was \$53. How many gigabytes were used?

29. A rectangle has length $x + 4$ feet and width $x - 1$ feet. Its perimeter is 42 feet. Find x and both dimensions.

30. A gym charges a \$25 registration fee plus \$12 per class. A student spent \$97. How many classes did the student take?

Solving Linear Equations – Answer Key

Equivalent algebraic steps are acceptable.

Part A: One-Step Equations

1. $x = 8$
2. $y = 7$
3. $a = 7$
4. $b = -15$
5. $m = -7$
6. $n = \frac{5}{4}$
7. $p = -24$
8. $q = 4.6$
9. $r = -5$
10. $s = 20$

Part B: Two-Step Equations

11. $x = 7$
12. $y = -6$
13. $a = 36$
14. $b = -5$
15. $m = -5$
16. $n = 7$
17. $p = 21$
18. $q = 18$
19. $r = 5$
20. $s = -5$

Part C: Multi-Step Equations

21. $4x - 12 = 2x + 10$; $x = 11$
22. $6y + 11 = 5y + 8$; $y = -3$
23. $9 - 6a = 4a + 19$; $a = -1$
24. $2(m - 2) + 3(m + 1) = 30$; $m = \frac{31}{5}$
25. $2n - 4 = 3n + 6$; $n = -10$
26. $7p - 17 = 4p + 11$; $p = \frac{28}{3}$
27. $-4q = 9 - q$; $q = -3$

Part D: Write and Solve

28. $18 + 7g = 53$; $g = 5$ GB
29. $2(x + 4) + 2(x - 1) = 42$; $x = 9$
    Dimensions: 13 ft $\times$ 8 ft.
30. $25 + 12c = 97$; $c = 6$ classes