LESSON 12-3 Practice A

Solving Equations with Variables on Both Sides

Group the terms with the variables on one side of the equal sign and simplify. Do not solve.

1. $9p = 6p + 21$ — $3p = 21$

2. $-5t - 14 = 2t$ — $-14 = 7t$

3. $2k = 18 - 4k$ — $6k = 18$

4. $-6u + 48 = 6u$ — $48 = 12u$

5. $7m - 25 = 2m$ — $-25 = -5m$

6. $\frac{5}{9}a = 6 + \frac{4}{9}a$ — $\frac{1}{9}a = 6$

Solve. Match each equation with its solution.

7. $8n = 6n - 14$

8. $7n + 8 = 11n$

9. $2n + 8 = 3n$

10. $\frac{3}{4}n + 2 = \frac{1}{4}n + 1$

11. $9 + 3n = 4n$

12. $\frac{5}{8}n + 5 = \frac{7}{8}n + 7$

A. n = 8

B. n = 9

C. n = −7

D. n = 2

E. n = −8

F. n = −2

13. Members of the Campus Roller Rink pay a yearly membership fee of $50 plus $5 each time they go skating. Nonmembers pay $10 each time they go skating. How many times would both a member and a nonmember have to go skating in a year in order to pay the same amount? 10 times

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LESSON 12-3 Practice B

Solving Equations with Variables on Both Sides

Group the terms with the variables on one side of the equal sign and simplify.

1. $10t = 6t + 24$ — $4t = 24$

2. $-6x - 32 = 2x$ — $-32 = 8x$

3. $j = 20 - 4j$ — $5j = 20$

4. $-5d + 40 = 5d$ — $40 = 10d$

5. $9m - 28 = 2m$ — $-28 = -7m$

6. $\frac{8}{9}x = 8 + \frac{4}{9}x$ — $\frac{4}{9}x = 8$

Solve.

7. $8k = 6k - 26$ — $k = -13$

8. $32 - 5v = 3v + 8$ — $v = 3$

9. $-12y - 10 = -6y + 14$ — $y = -4$

10. $\frac{5}{8}a + 6 = \frac{3}{4}a$ — $a = 48$

11. $\frac{1}{4}n + 10 = \frac{2}{3}n$ — $n = 24$

12. $20 - \frac{1}{5}d = \frac{3}{10}d + 16$ — $d = 8$

13. Members of the Lake Shawnee Club pay $40 per summer season plus $7.50 each time they rent a boat. Nonmembers pay $12.50 each time they rent a boat. How many times would both a member and a nonmember have to rent a boat in order to pay the same amount? 8 times

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LESSON 12-3 Practice C

Solving Equations with Variables on Both Sides

Group the terms with variables on one side of the equal sign and simplify.

1. $15t = 17 + 8t - 24$ — $7t = -7$

2. $6a - 42 = 2a + a$ — $-42 = -3a$

3. $6k - k = 27 - 4k$ — $9k = 27$

4. $-5f + 40 = 5f + 30$ — $10 = 10f$

5. $\frac{9}{10}m - 28 = \frac{7}{10}m + 12$ — $\frac{1}{5}m = 40$

6. $\frac{8}{15}x = 8 + \frac{2}{15}x - \frac{4}{15}x$ — $\frac{2}{3}x = 8$

Solve. Check each answer.

7. $18r - 2 - 12r = -6r - 26$ — $r = -2$

8. $10 + 8c + 15 = -2c - 40$ — $c = -6.5$

9. $-3w + 6 = 8w + 9 - 2w$ — $w = -\frac{1}{3}$

10. $0.8a - 6 = -0.6a + 22$ — $a = 20$

11. $\frac{1}{2}n - 1\frac{5}{12} = \frac{2}{3}n - 2\frac{1}{6}$ — $n = 4\frac{1}{2}$

12. $\frac{13}{15} - \frac{d}{5} = \frac{5}{6} + \frac{d}{3}$ — $d = \frac{1}{16}$

13. A golf course charges nonmembers $48 per round plus a golf cart rental fee of $24 per round. A member pays a monthly fee of $384 plus a golf cart rental fee of $8 per round. How many rounds would both a member and a nonmember have to play in order to pay the same amount? 6 rounds

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CHAPTER 12-3 Reteach

Solving Equations with Variables on Both Sides

Some equations have like terms that are on opposite sides of the equal sign. To solve these equations, first identify the like term with the lesser coefficient.

$2x = 25 - 3x$ ← $2x$ and $-3x$ are like terms.

Since $-3 < 2$, $-3x$ is the term with the lesser coefficient. Move $-3x$ to the opposite side of the equation by adding $3x$ to each side of the equation.

$2x = 25 - 3x$

$2x + \mathbf{3x} = 25 - 3x + \mathbf{3x}$

$5x = 25$

$\frac{5x}{5} = \frac{25}{5}$

$x = 5$

Complete the steps to solve the equation.

1. $5x + 16 = 9x$

The like terms are 5x and 9x. The like term with the lesser coefficient is 5x.

$5x + 16 = 9x$

$5x - 5x + 16 = 9x - 5x$

$16 = 4x$

$\frac{16}{4} = \frac{4x}{4}$

$4 = x$

2. $3a + 1 = 15 - 4a$

The like terms are 3a and −4a. The like term with the lesser coefficient is −4a.

$3a + 1 = 15 - 4a$

$3a + 4a + 1 = 15 - 4a + 4a$

$7a + 1 = 15$

$7a + 1 - 1 = 15 - 1$

$7a = 14$

$\frac{7a}{7} = \frac{14}{7}$

$a = 2$

Solve.

3. $8d = 7d + 13$ — $d = 13$

4. $-4p - 16 = 4p$ — $p = -2$

5. $3n = 25 - 2n$ — $n = 5$

6. $9c - 6 = 2c + 15$ — $c = 3$

7. $16 - 6k = 20 - 2k$ — $k = -1$

8. $2h + 8 = 2 - h$ — $h = -2$

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