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Module 3 Solving Linear Equations
of One Variable
Lesson 5 Solving Multi-Step Linear Equations



**independent
practice**

Solve and check.

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| 1. $6x + 3x - x = 96$ $x = 12$ | 2. $11P + 3P - 15P = 743$ $P = -743$ |
| 3. $7r + 11r = 725 - 7r$ $r = 29$ | 4. $a - 9a + 75 = 135 + 2a$ $a = -6$ |
| 5. $2(7h - 3) = 120$ $h = 9$ | 6. $3(5w + 15) = 210$ $w = 11$ |
| 7. $-9(3y - 4) = -531$ $y = 21$ | 8. $-(5 - t) = 0[37t - 12t + 5(14 + 3t)]$ $t = 5$ |
| 9. $3 + d = 9 - d$ $d = 3$ | 10. $64 - 7K = -11K + 8$ $K = -14$ |
| 11. $11 + 2G = 2G - (G - 15)$ $G = 4$ | 12. $m + (m + 2) + (m + 4) = 72$ $m = 22$ |
| 13. $n + (n + 1) + (n + 2) + (n + 3) = -122$
$n = -32$ | 14. $\frac{7x}{2} = 21$
$x = 6$ |
| 15. $\frac{8w}{3} + 5 = 13$ $w = 3$ | 16. $0.47x = -3.23x + 62.9$ $x = 17$ |
| 17. $\frac{v}{5} + \frac{2}{3} = \frac{6}{5} + \frac{v}{15}$ $v = 4$ | 18. $\frac{D}{2} - \frac{2D}{3} = \frac{7D}{6} + 1$ $D = -\frac{3}{4}$ |
| 19. $5.2y + 7.2 = 30.6 - 1.3y$
$y = 3.6$ | 20. $c + 0.1c + 0.01c - 0.001c = c + 0.545$
$c = 5$ |

Journal

- Describe the steps you would use to solve the equation, $3x + 4x - 2 = 5x - 6 + 2$.
- Explain to a friend who missed this lesson how you determine if an equation has a solution of either "all real numbers" or "no solution".
- Do you still need to use the order of operations when solving multi-step linear equations? Could you solve $3(7h + 4) - h = 7$ without using the order of operations?
- What method would you use to simplify the equation $\frac{3}{4}(6a + 2) = \frac{1}{2}(3a - 1)$?
- Supply the reasons for each step to solve the equation, $3(j + 2) = 4j + 7 - 5$.

Possible Journal Answers

- | | |
|---------------------------------|----------------------------------|
| 1. $3x + 4x - 2 = 5x - 6 + 2$ | Given |
| $(3x + 4x) - 2 = 5x + (-6 + 2)$ | Associative Property of Addition |
| $7x - 2 = 5x - 4$ | Combining Like Terms |
| $2x - 2 = -4$ | Subtraction Property of Equality |
| $2x = -2$ | Addition Property of Equality |
| $x = -1$ | Division Property of Equality |

Cumulative Review

Simplify.

1. $2 - 3 \cdot 4 + 9$ -1 2. $5 - 3(4 + 1) + 2(7)$ 4
3. $14 + (3 + 4(7 - 3)) - 10(3 + 9)$ -87

Combine like terms.

4. $2x - 3y + 5 - x + 7y$ $x + 4y + 5$

Simplify.

5. $7x - 5x(3 - y) + (8(x + 2) - 3(y + 2))$ $5xy - 3y + 10$

Solve the following problems.

6. Name the property illustrated by this equation: $A + B = B + A$

Commutative Property of Addition

7. Briefly describe the difference between “terms” and “factors”.

In an equation or an expression, “terms” are separated from one another by addition or subtraction and “factors” are separated by multiplication.

8. Evaluate: $\frac{1}{2}bh$ where $b = 7$ and $h = 12$. 42

9. Evaluate: $\frac{-b + \sqrt{(b^2 - 4ac)}}{2a}$ where $a = 4$, $b = -12$ and $c = 9$. $\frac{3}{2}$ or $1\frac{1}{2}$

10. Find the perimeter of a square, which has an area of 225 square inches.

The perimeter is 60 inches.

Possible Journal Answers (continued)

2. After you have simplified the equation, if there is no variable in the expression and it satisfies the Reflexive Property of Equality, then the solution set is all real solutions. After you have simplified the equation, if the expression does not satisfy the Reflexive Property of Equality, then the solution set is no solution.
3. Yes, the rules for the order of operations will be needed on all of the examples. The equation, $3(7h + 4) - h = 7$, could not be simplified without the order of operations. You perform multiplication first getting $21h + 12 - h = 7$. Now you can combine like terms and simplify.
4. Answers may vary, but correct answers will indicate some method dealing with the rational factors on each side of the equation. If we multiply each side by 4, we have $3(6a + 2) = 2(3a - 1)$. We can now use the Distributive Property of Multiplication Over Addition and simplify.
5. $3(j + 2) = 4j + 7 - 5$ Given
 $3j + 6 = 4j + 7 - 5$
 $3j + 6 = 4j + (7 - 5)$ Associative Property of Addition
 $3j + 6 = 4j + 2$ Subtraction
 $4 = j$ Subtraction Property of Equality