

# Section 5.R.3 Solving One-Step Linear Equations

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## Checking Solutions in Equations

Linear Equation in  $x$

If  $a$ ,  $b$ , and  $c$  are **constants** and  $a \neq 0$ , then a **linear equation in  $x$**  is \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

### ▮ Example 1 Checking Given Solutions in Equations

Determine whether the given real number is a solution to the given equation by substituting for the variable and checking to see if the resulting equation is true or false.

a.  $x + 5 = -2$  given that  $x = -7$

c.  $5.6 - y = 2.9$  given that  $y = 2.7$

b.  $1.4 + z = 0.5$  given that  $z = -1.1$

d.  $|z| - 14 = -3$  given that  $z = -10$

**Solution**

## Exercises

Determine whether the given number is a solution to the given equation by substituting and then evaluating.

1.  $x + 4 = 2$  given that  $x = -2$

5.  $-10 + x = -14$  given that  $x = -4$

2.  $z + (-12) = 6$  given that  $z = 18$

6.  $-9 - x = -14$  given that  $x = 5$

3.  $x - 3 = -7$  given that  $x = 4$

7.  $-26 + |x| = -8$  given that  $x = -18$

4.  $x - 2 = -3$  given that  $x = 1$

## Solving Equations of the Form $x + b = c$

### Addition Principle of Equality

If the same algebraic expression is added to \_\_\_\_\_  
 \_\_\_\_\_ . Symbolically, if  $A$ ,  $B$ , and  $C$  are algebraic  
 expressions, then the equations

\_\_\_\_\_ and  
 \_\_\_\_\_

\_\_\_\_\_.

### Procedure for Solving Linear Equations that Simplify to the Form $x + b = c$

1. Combine \_\_\_\_\_.
2. Use the **addition principle of equality** and \_\_\_\_\_.  
 The objective is to \_\_\_\_\_.  
 \_\_\_\_\_.
3. Check your answer by \_\_\_\_\_.

### ▮ Example 6 Simplifying and Solving Linear Equations

Simplify and solve:  $3z - 2z + 2 = 3 + 8$

**Solution**

Name:

Date:

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## Exercises

Solve each equation.

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8.  $x - 6 = 1$

11.  $6 = z + 12$

14.  $3n - 2n + 6 = 14$

9.  $y + 7 = 3$

12.  $x + 2.7 = 3.8$

15.  $1.5y - 0.5y + 6.7 = -5.3$

10.  $22 = n - 15$

13.  $n - \frac{2}{7} = \frac{3}{14}$

## Solving Equations of the Form $ax = c$

### Multiplication (or Division) Principle of Equality

If both sides of an equation are multiplied by (or divided by) the \_\_\_\_\_  
 \_\_\_\_\_. Symbolically, if  $A$  and  $B$  are  
 algebraic expressions and  $C$  is any nonzero constant, then the equations

\_\_\_\_\_

### Procedure for Solving Linear Equations that Simplify to the Form $ax = c$

1. Combine \_\_\_\_\_.
2. Use the **multiplication** (or **division**) **principle of equality** and multiply both sides of the equation by the \_\_\_\_\_ (or **divide both sides by** \_\_\_\_\_). The coefficient of the variable will become \_\_\_\_\_.
3. Check your answer by \_\_\_\_\_.

#### ▮ Example 9 Solving Linear Equations of the Form $ax = c$

Solve the linear equation:  $1.1x + 0.2x = 12.2 - 3.1$

**Solution**

Name:

Date:

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## Exercises

Solve each equation.

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16.  $5x = 45$

20.  $\frac{3x}{4} = 15$

23.  $10n - 11n = 20 - 14$

17.  $9x = 108$

21.  $\frac{y}{5} = 2$

24.  $1.7y + 1.3y = 6.3$

18.  $32 = 4y$

22.  $-1 = \frac{x}{8}$

25.  $7.5x = -99.75$

19.  $51 = 17y$