

Algebra 1A

Lesson 3.1 Solve One - Step Equations

Warm-Up

Simplify each of the following expressions.

(a) $3x + 5 + 4x - 2$

$$\begin{array}{r} 3x + 5 + 4x - 2 \\ \hline 7x + 3 \end{array}$$

(b) $5x - (6 - x)$

$$\begin{array}{r} 5x - 6 + x \\ \hline 6x - 6 \end{array}$$

(c) $23 + 4(x + 2)$

$$\begin{array}{r} 23 + 4x + 8 \\ \hline 4x + 31 \end{array}$$

(d) $x(7 + x) + 9x^2$

$$\begin{array}{r} 7x + x^2 + 9x^2 \\ \hline 10x^2 + 7x \end{array}$$

Addition Property of Equality

If $x - a = b$, then $x - a + a = b + a$, or $x = b + a$.

Subtraction Property of Equality

If $x + a = b$, then $x + a - a = b - a$, or $x = b - a$.

Example 1. Solve an Equation Using Subtraction

Solve $x + 9 = 3$.

$$\begin{array}{r} x + 9 = 3 \\ -9 \quad -9 \\ \hline x = -6 \end{array}$$

Example 2. Solve an Equation Using Addition

Solve $x - 2 = 11$.

$$\begin{array}{r} x - 2 = 11 \\ +2 \quad +2 \\ \hline x = 13 \end{array}$$

Multiplication Property of Equality

If $\frac{x}{a} = b$, then $a \cdot \frac{x}{a} = a \cdot b$, or $x = ab$.

Division Property of Equality

If $ax = b$, then $\frac{ax}{a} = \frac{b}{a}$, or $x = \frac{b}{a}$.

Example 3. Solve an Equation Using Division

Solve $-4x = -28$.

$$\begin{array}{r} -4x = -28 \\ \div -4 \quad \div -4 \\ \hline x = 7 \end{array}$$

Example 4. Solve an Equation Using

Solve $\frac{x}{3} = 7$.

$$\begin{array}{r} 3 \cdot \frac{x}{3} = 7 \cdot 3 \\ \hline x = 21 \end{array}$$

Try It!

Solve each of the following equations.

(a) $7 \cdot 6 = \frac{c}{7} \cdot 7$

$$c = 42$$

(b) $m - 11 = -5$
+11 +11

$$m = 6$$

(c) $24 = -8y$
 $\frac{24}{-8} = \frac{-8y}{-8}$

$$y = -3$$

(d) $y + 7 = 10$
 $\frac{-7}{-7} \frac{-7}{-7}$

$$y = 3$$

Example 5. Solve an Equation by Multiplying by the Reciprocal

(a) Solve $\frac{3}{5}x = -9$

$$\frac{5}{3} \left(\frac{3}{5}x \right) = \frac{5}{3} (-9)$$

$$x = -15$$

(b) Solve $9 = -\frac{3}{4}a$

$$\left(-\frac{4}{3} \right) \left(9 \right) = \left(-\frac{4}{3} \right) \left(-\frac{3}{4}a \right)$$

$$a = -12$$

Try It!

Solve.

(a) $\frac{5}{6}d = 10$

$$\left(\frac{6}{5} \right) \left(\frac{5}{6}d \right) = \left(\frac{6}{5} \right) (10)$$

$$d = 12$$

(b) $-\frac{4}{5}t = -8$

$$\left(-\frac{5}{4} \right) \left(-\frac{4}{5}t \right) = \left(-\frac{5}{4} \right) (-8)$$

$$t = 10$$

Assignment: Pages 137 - 138 (4 - 48) even**Review:**

Write and solve an equation to answer the question.

- The selling price of a certain video is \$7 more than the price the store paid. If the selling price is \$24, find the price the store paid.
- Jackie Joyner-Kersey won a gold medal in the Olympic Heptathlon in 1988 and in 1992. Her 1992 score was 7044 points. This was 247 fewer than her 1988 score. What was her 1988 score?
- Turner Field in Atlanta, GA, has 49,831 seats. Jacobs field in Cleveland, OH, has 43,368 seats. How many seats would need to be added to Jacobs Field for it to have as many seats as Turner Field?