

Algebra 1 2.4

$$\begin{aligned}2 \cdot 72 + 6 &= 2(72 + 3) \\144 + 6 &= 2(75) \\150 &= 150\end{aligned}$$

Solve equations with the variable on each side.

Solve equations with grouping symbols.

identity

no solution

all real numbers

$$2x + 6 = 2(x + 3)$$

$$\begin{array}{r} 2x + 6 = 2x + 6 \\ -2x \quad -2x \end{array}$$

$$2 \cdot 32 + 6 = 2(32 + 3)$$

$$64 + 6 = 2(35)$$

$70 = 70$

$$6 = 6$$

Algebra tiles

$$\begin{array}{r} 3x + 5 = 2x + 4 \\ -2x \quad -2x \\ \hline x + 5 = 4 \\ -5 \quad -5 \\ \hline x = -1 \end{array}$$

Example 1 Solve an Equation with Variables on Each Side

Solve $2 + 5k = 3k - 6$. Check your solution.

Solve each equation. Check your solution.

1A. $3w + 2 = 7w$

1C. $\left(\frac{x}{2}\right) + 1 = \frac{1}{4}x - 6$

$$\begin{array}{rcl} \frac{1}{2}x + 1 & = & \frac{1}{4}x - 6 \\ -\frac{1}{2}x & & -\frac{1}{2}x \end{array}$$

$$\begin{array}{rcl} +1 & = & -\frac{1}{4}x - 6 \\ +1 & & +1 \end{array}$$

$$x = -28 \quad \frac{7}{-\frac{1}{4}} \quad \frac{-1}{-\frac{1}{4}}$$

1B. $5a + 2 = 6 - 7a$

1D. $1.3c = 3.3c + 2.8$

$$\begin{array}{rcl} 0 & = & 2c + 2.8 \\ -2.8 & & -2.8 \\ \hline -2.8 & = & 2c \\ 2 & & 2 \end{array}$$

$$-1.4 = c$$

$$\begin{array}{rcl} 4 & = & 8 - 12a \\ -8 & & -8 \\ \hline -4 & = & -12a \\ -12 & & -12 \\ \hline a & = & \frac{1}{3} \end{array}$$

NAME: _____

Solve each equation. Check your solution.

2A. $8x - 10 = 3(6 - 2x)$

$$\begin{array}{rcl} 8x - 10 & = & 18 - 6x \\ +10 & & +10 \\ \hline 8x & = & 28 - 6x \\ +6x & & +6x \\ \hline \frac{14x}{14} & - \frac{28}{14} & x = 2 \end{array}$$

2B. $7(n - 1) = -2(3 + n)$

$$\begin{array}{rcl} 7n \cancel{-7} & = & -6 \cancel{+} -2n \\ \hline 7n & = & 1 \cancel{+} \cancel{-2n} \\ \hline \frac{7n}{7} & = & \frac{1}{7} \\ n & = & \frac{1}{7} \end{array}$$

TBL

Example 3 Find Special Solutions

Solve each equation.

a. $5x + 5 = 3(5x - 4) - 10x$

$$5x + 5 = 15x - 12 + 10x$$

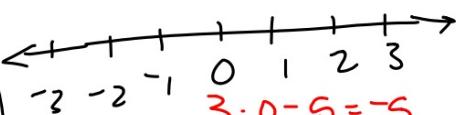
$$5x + 5 = 5x - 12$$

$$\cancel{5x} + \cancel{5} = \cancel{5x} - 12$$

$$0 = -17 \quad \text{NS}$$

b. $3(2b - 1) - 7 = 6b - 10$

∅



$$3n - 5 = -5$$

$$\frac{3n}{3} = \frac{0}{3}$$

$$n = 0$$

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$$\mathbf{3A.} \ 7x + 5(x - 1) = -5 + 12x$$

$$\mathbf{3B.} \ 6(y - 5) = 2(10 + 3y)$$

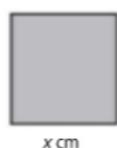
ConceptSummary Steps for Solving Equations



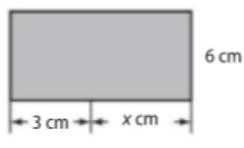
- Step 1** Simplify the expressions on each side. Use the Distributive Property as needed.
- Step 2** Use the Addition and/or Subtraction Properties of Equality to get the variables on one side and the numbers without variables on the other side. Simplify.
- Step 3** Use the Multiplication or Division Property of Equality to solve.

Standardized Test Example 4 Write an Equation

Find the value of x so that the figures have the same area.



10 cm



6 cm

A 3

B 4.5

C 6.5

D 7