

Oct. 3rd

Solving Equations with Variables on both sides of the equal sign

$$\textcircled{3}x - 10 + \textcircled{4}x = -2(x - 4) + 9$$

$$7x - 10 = -2x + \textcircled{8} + \textcircled{9}$$

$$\begin{array}{r} 7x - 10 = -2x + 17 \\ +10 \qquad \qquad +10 \end{array}$$

$$\begin{array}{r} 7x = -2x + 27 \\ +2x \quad \cancel{+2x} \end{array}$$

$$\frac{9x}{9} = \frac{27}{9}$$

$$\textcircled{x = 3}$$

$$\frac{1}{2}(n-4) - 7 = -2n + 6$$

$$\frac{1}{2}n - 2 - 7 = -2n + 6$$

$$\frac{1}{2}n - 9 = -2n + 6$$

~~+9~~ ~~+9~~

$$\frac{1}{2}n = -2n + 15$$

~~+2n~~ ~~+2n~~

$$2\frac{1}{2}n = 15$$

$$\left(\frac{2}{5}\right)\frac{5}{2}n = 15\left(\frac{2}{5}\right)$$

$$n = 6$$

EXAMPLE 1 Try It! Solve Equations With a Variable on Both Sides

1. Solve each equation.

a. $100(z - 0.2) = -10(5z + 0.8)$

b. $\frac{5}{8}(16d + 24) = 6(d - 1) + 1$

$$\begin{array}{r} 100z - 20 = -50z - 8 \\ +20 \qquad +20 \end{array}$$

$$10d + 15 = 6d - 6 + 1$$

$$\begin{array}{r} 100z = -50z + 12 \\ +50 \qquad +50 \end{array}$$

$$\begin{array}{r} 10d + 15 = 6d - 5 \\ -15 \qquad -15 \end{array}$$

$$\frac{150z}{150} = \frac{12}{150}$$

$$\begin{array}{r} 10d = 6d - 20 \\ -6d \quad -6d \end{array}$$

$$z = \frac{12 \div 2}{150 \div 2}$$

$$\frac{4d}{4} = \frac{-20}{4}$$

$$z = \frac{6 \div 3}{75 \div 3}$$

$$z = \frac{2}{25}$$

$$d = -5$$

EXAMPLE 2 Try It! Understand Equations with Infinitely Many or No Solutions

2. Solve each equation. Is the equation an identity? Explain.

a. $t - 27 = -(27 - t)$

b. $16(4 - 3m) = 96\left(-\frac{m}{2} + 1\right)$

HABITS OF MIND

Construct Arguments One student maintains that the order in which terms are collected on each side of an equation does not matter. Construct an argument to support or refute the student's position. © MP.3

can clear decimals + fractions after all parentheses have been mathematically removed.

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