

What you will learn about:
Solving Equations
With Variables on Both Sides

Solve:

$$\frac{7x + 8}{-8} = \frac{-13}{-8}$$

$$\frac{7x}{7} = \frac{-21}{7}$$

$$x = -3$$

$$\begin{array}{r} 9x = 8x - 6 \\ -8x \quad -8x \\ \hline \end{array}$$

$$x = -6$$

$$\begin{array}{r} 7x + 5 = 6x + 2 \\ -6x \quad -6x \\ \hline \end{array}$$

$$x + 5 = 2$$

$$x = -3$$

$$\begin{array}{r} 8n - 4 = -2n + 6 \\ +2n \quad +2n \\ \hline \end{array}$$

$$\begin{array}{r} 10n - 4 = 6 \\ +4 \quad +4 \\ \hline \end{array}$$

$$10n = 10$$

$$n = 1$$

$$\begin{array}{r} \frac{5}{4}x + 6 = \frac{1}{4}x - 2 \\ -\frac{1}{4}x \quad -\frac{1}{4}x \\ \hline \end{array}$$

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

$$x = -8$$

$$\begin{array}{r} 5y - 9 = 16 \\ +9 \quad +9 \\ \hline \end{array}$$

$$\frac{5y}{5} = \frac{25}{5}$$

$$y = 5$$

$$\begin{array}{r} -6h = -7h - 1 \\ +7h \quad +7h \\ \hline \end{array}$$

$$h = -1$$

$$\begin{array}{r} 9y + 4 = 7y + 12 \\ -7y \quad -7y \\ \hline \end{array}$$

$$2y + 4 = 12$$

$$2y = 8$$

$$y = 4$$

$$\begin{array}{r} 8q - 5 = -4q + 7 \\ +4q \quad +4q \\ \hline \end{array}$$

$$\begin{array}{r} 12q - 5 = 7 \\ +5 \quad +5 \\ \hline \end{array}$$

$$12q = 12$$

$$q = 1$$

$$\frac{7}{8}x - 12 = -\frac{1}{8}x - 2$$

$$\begin{array}{r} x - 12 = -2 \\ +12 \quad +12 \\ \hline \end{array}$$

$$x = 10$$

$$\frac{6}{6} = 1$$

$$\frac{7}{6}y + 11 = \frac{1}{6}y + 8$$

$$-\frac{1}{6}y \quad -\frac{1}{6}y$$

$$y + 11 = 8$$

$$y = -3$$

$$7.8x + 4 = 5.4x - 8$$

$$-5.4x \quad -5.4x$$

$$2.4x + 4 = -8$$

$$-4 \quad -4$$

$$\frac{2.4x}{2.4} = \frac{-12}{2.4}$$

$$x = -5$$

$$24 \overline{) -120} \\ \underline{120} \\ 0$$

$$4.2 \overline{) 210} \\ \underline{210} \\ 0$$

$$2.8x + 12 = -1.4x - 9$$

$$+ 1.4x \quad + 1.4x$$

$$4.2x + 12 = -9$$

$$4.2x = -21$$

$$x = -5$$

$$2.8x + 12 = -1.4x - 9$$

4.

What you will learn about:
Solving Equations

Solve for the given variable

$$-6(x+3) = 24$$

$$\begin{array}{r} -6x - 18 = 24 \\ +18 \quad +18 \end{array}$$

$$\begin{array}{r} -6x = 42 \\ \underline{-6} \quad \underline{-6} \\ x = -7 \end{array}$$

$$5(a-3) + 5 = -10$$

$$5a - 15 + 5 = -10$$

$$\begin{array}{r} 5a - 10 = -10 \\ +10 \quad +10 \end{array}$$

$$5a = 0 \quad a = 0$$

$$\frac{2}{3}(9x-12) = 8+2x$$

$$\begin{array}{r} 6x - 8 = 8 + 2x \\ -2x \quad \quad -2x \end{array}$$

$$\begin{array}{r} 4x - 8 = 8 \\ +8 \quad +8 \\ 4x = 16 \quad x = 4 \end{array}$$

$$12 - 3(4t+3) = -17$$

$$12 - 12t - 9 = -17$$

$$\begin{array}{r} -12t + 3 = -17 \\ \quad \quad -3 \quad -3 \end{array}$$

$$\begin{array}{r} -12t = -20 \\ \underline{-12} \quad \underline{-12} \end{array}$$

$$t = \frac{20}{12} = \frac{5}{3}$$

$$-(y+9) = 8$$

$$-y - 9 = 8$$

$$-y = 17$$

$$y = -17$$

$$\frac{2}{3}(6m-3) = 8-m$$

$$\begin{array}{r} 4m - 2 = 8 - m \\ +m \quad \quad +m \end{array}$$

$$5m - 2 = 8$$

$$5m = 10$$

$$m = 2$$

$$8 - 2(3y+5) = 0$$

$$8 - 6y - 10 = 0$$

$$-6y - 2 = 0$$

$$\begin{array}{r} -6y = 2 \\ \underline{-6} \quad \underline{-6} \\ y = -\frac{1}{3} \end{array}$$

$$4(x-1) - 2 = 5(2x+3) + 6$$

$$4x - 4 - 2 = 10x + 15 + 6$$

$$4x - 6 = 10x + 21$$

$$\begin{array}{r} -4x \quad \quad -4x \end{array}$$

$$-6 = 6x + 21$$

$$\begin{array}{r} -21 \quad \quad -21 \end{array}$$

$$-27 = 6x$$

$$x = \frac{-27}{6} = -\frac{9}{2}$$

$$\frac{2}{3} \cdot \frac{6}{1} = \frac{12}{3} = 4$$

$$\frac{\frac{2}{3}}{\frac{6}{3}} = \frac{1}{3}$$

$$6(p-3) - 7 = 5(4p+3) - 12$$

$$6p - 18 - 7 = 20p + 15 - 12$$

$$6p - 25 = 20p + 3$$

$$-25 = 14p + 3$$

$$-28 = 14p$$

$$p = -2$$

$$8(q+1) - 5 = 3(2q-4) - 1$$

$$8q + 8 - 5 = 6q - 12 - 1$$

$$8q + 3 = 6q - 13$$

$$-6q \quad -6q$$

$$2q + 3 = -13$$

$$-3 \quad -3$$

$$2q = -16$$

$$q = -8$$

$$10[3 - 8(2x - 5)] = 15(40 - 5x)$$

$$10(3 - 16x + 40) = 600 - 75x$$

$$10(-16x + 43) = 600 - 75x$$

$$-160x + 430 = 600 - 75x$$

$$+ 75x$$

$$+ 75x$$

$$12[1 - 5(4z - 1)] = 3(24 + 11z)$$

$$12[1 - 20z + 5] = 3(24 + 11z)$$

$$12[-20z + 6] = 3(24 + 11z)$$

$$-240z + 72 = 72 + 33z$$

$$-273z + 72 = 72$$

$$-273z = 0$$

$$0.36(100n + 5) = 0.6(30n + 15)$$

$$36n + 1.8 = 18n + 9$$

$$-18n$$

$$-18n$$

$$18n + 1.8 = 9$$

$$-1.8 \quad -1.8$$

$$16n = 7.2$$

$$\frac{16}{16} \quad \frac{7.2}{16}$$

$$n = .4$$

$$-85x + 430 = 600$$

$$-430 \quad -430$$

$$-85x = 170$$

$$-85 \quad -85$$

$$x = -2$$

$$-273z = 0$$

$$z = 0$$

$$18 \overline{) 7.2} \begin{array}{r} .4 \\ 72 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 15 \\ 180 \\ -75 \\ \hline 85 \end{array}$$

$$\begin{array}{r} 3 \\ .36 \\ 5 \\ \hline 1.80 \end{array}$$

$$\begin{array}{r} 30 \\ .6 \\ \hline 18.0 \end{array} \quad \begin{array}{r} 15 \\ .6 \\ \hline 9.0 \end{array}$$

Conditional Equation

One Solution

$$7x + 8 = -13$$

$$\quad -8 \quad -8$$

$$7x = -21$$

$$x = -3$$

Conditional

Identity

All Real Numbers

$$24 - 6r = 6(4 - r)$$

$$24 - 6r = 24 - 6r$$

$$\quad +6r \quad \quad +6r$$

$$24 = 24$$

Identity

Contradiction

No Solution

$$12c - 4 = 12c$$

$$\quad -12c \quad -12c$$

$$-4 \neq 0$$

Contradiction

Classify the equation as conditional, identity, or contradiction. Then state the solution.

$$6(2n - 1) + 3 = 2n - 8 + 5(2n + 1)$$

$$12n - 6 + 3 = 2n - 8 + 10n + 5$$

$$12n - 3 = 12n - 3$$

Identity