

MATH 020 Support 3: Solving Linear Equations

A linear equation in one variable can be written in the form  $ax + b = 0$ .

Problems

Solve the linear equation.

1.  $7x + 5 = 26$

$$\begin{array}{r} 7x + 5 = 26 \\ -5 \quad -5 \\ \hline 7x = 21 \end{array} \Rightarrow x = \frac{21}{7} = \boxed{3}$$

2.  $7m + 18 = 9m - 2$

$$\begin{array}{r} 7m + 18 = 9m - 2 \\ -7m \quad -7m \\ \hline 18 = 2m - 2 \\ +2 \quad +2 \\ \hline 20 = 2m \\ \boxed{10 = m} \end{array}$$

$$7(\underline{10}) + 18 = 9(\underline{10}) - 2$$

$$\begin{array}{r} 70 + 18 \\ \hline 88 \end{array} \quad \begin{array}{r} 90 - 2 \\ \hline 88 \end{array}$$

3.  $-3y + 9 = -3(2y + 4)$

$$\begin{array}{r} -3y + 9 = -6y - 12 \\ +6y \quad +6y \\ \hline 3y + 9 = -12 \\ -9 \quad -9 \\ \hline 3y = -21 \end{array}$$

$$y = \frac{-21}{3}$$

$$\boxed{y = -7}$$

4.  $4(2x - 1) - 2(2x) = 2$

$$\begin{array}{r} 8x - 4 - 4x = 2 \\ \hline 4x - 4 = 2 \\ +4 \quad +4 \\ \hline 4x = 6 \end{array} \Rightarrow \boxed{x = \frac{6}{4} = \frac{3}{2}}$$

$$8x - 4x - 4 = 2$$

$$4x = 6$$

$$x = \frac{6}{4} = \boxed{\frac{3}{2}}$$

5.  $0.50x + 0.35(50) = 29.5$

$$\begin{array}{r} 0.50x + 17.5 = 29.5 \\ -17.5 \quad -17.5 \\ \hline 0.50x = 12 \end{array}$$

$$0.50x = 12$$

$$x = \frac{12}{0.50} = \boxed{24}$$

6.  $0.04(x-4) + 0.10x = 0.06x - 0.9$

$$0.04x - 0.16 + 0.10x = 0.06x - 0.9$$

$$\begin{array}{r} 0.14x - 0.16 = 0.06x - 0.9 \\ -0.06x \phantom{-0.16} = -0.06x \phantom{-0.9} \end{array}$$

$$\begin{array}{r} 0.08x - 0.16 = -0.9 \\ +0.16 \phantom{-0.16} +0.16 \end{array}$$

$$0.08x = -0.74$$

$$x = -9.25$$

Write the following as an equation. Then solve.

7. The sum of ten times a number, and fifty-five, is equal to nine times the number. Find the number.

$$\begin{array}{r} 10x + 55 = 9x \\ -10x \phantom{+55} -10x \end{array}$$

$$55 = -1x$$

$$-55 = x$$

8. Five times a number, minus four, is equal to four times the number, plus six.

$$\begin{array}{r} 5x - 4 = 4x + 6 \\ -4x \phantom{-4} -4x \end{array}$$

$$\begin{array}{r} x - 4 = 6 \\ +4 \phantom{-4} +4 \end{array}$$

$$x = 10$$