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. \[
\frac{7x + 5 = 26}{-5} \quad \Rightarrow \quad x = \frac{21}{7} = 3
\]

2. \[
\frac{7m + 18 = 9m - 2}{-7m} \quad \Rightarrow \quad 70 + 18 = 9(10) - 2
\]
\[
70 + 18 = 90 - 2
\]
\[
88 = 88
\]

3. \[
-3y + 9 = -3(2y + 4)
\]
\[
-3y + 9 = -6y - 12
\]
\[
+6y \quad +6y
\]
\[
3y + 9 = -12
\]
\[
-9 \quad -9
\]
\[
y = \frac{-21}{3} \rightarrow y = -7
\]

4. \[
4(2x - 1) - 2(2x) = 2
\]
\[
8x - 4 - 4x = 2
\]
\[
4x - 4 = 2
\]
\[
+4 \quad +4
\]
\[
4x = 6
\]
\[
x = \frac{6}{4} = \frac{3}{2}
\]

5. \[
0.50x + 0.35(50) = 29.5
\]
\[
0.50x + 17.5 = 29.5
\]
\[
-17.5 - 17.5
\]
\[
0.50x = 12
\]
\[
x = \frac{12}{0.50} = 24
\]
6. \[0.04(x - 4) + 0.10x = 0.06x - 0.9\]
\[0.04x - 0.16 + 0.10x = 0.06x - 0.9\]
\[-0.06x = -0.9 + 0.16\]
\[-0.06x = -0.74\]
\[x = -9.25\]

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.

\[10x + 55 = 9x\]
\[-10x\]

\[55 = -x\]
\[-55 = x\]

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

\[5x - 4 = 4x + 6\]
\[-4x\]

\[x - 4 = 6\]
\[+4\]
\[x = 10\]