

Unit 1 Day 1 Lesson Solving Equations

Vocabulary

Variable – a letter that takes the place of a number

Constant – a number that doesn't change

Coefficient – the number in front of the variable

$2x$

Distribution –

$$a(b+c) = ab+ac$$

$$x + 7 = 10$$
$$\begin{array}{r} -7 \quad -7 \\ \hline \end{array}$$
$$x = 3$$

$$x - 5 = 3$$
$$\begin{array}{r} +5 \quad +5 \\ \hline \end{array}$$
$$x = 8$$

$$2x = 8$$
$$\begin{array}{r} \frac{2}{2} \quad \frac{8}{2} \\ \hline \end{array}$$
$$x = 4$$

$$4 \cdot \frac{x}{4} = 3 \cdot 4$$
$$x = 12$$


$$\begin{array}{r}
 3x + 7 = 16 \\
 \underline{-7 \quad -7} \\
 3x = 9 \\
 \underline{\quad 3 \quad 3} \\
 x = 3
 \end{array}$$

$$\begin{array}{r}
 2x - 9 = 13 \\
 \underline{+9 \quad +9} \\
 2x = 22 \\
 \underline{\quad 2 \quad 2} \\
 x = 11
 \end{array}$$

$$\begin{array}{r}
 2x + 10 = 7x \\
 \underline{-10 \quad -10} \\
 2x = 7x - 10 \\
 \underline{-7x \quad -7x} \\
 -5x = -10 \\
 \underline{-5 \quad -5} \\
 x = 2
 \end{array}$$

$$\begin{array}{r}
 -4x + 24 = 2x \quad x = +4? \\
 \underline{-24 \quad -24} \\
 -4x = 2x - 24 \\
 \underline{-2x \quad -2x} \\
 -6x = -24 \\
 \underline{-6 \quad -6} \\
 x = 4
 \end{array}$$

$$\begin{array}{r}
 2(x+3) = 30 \\
 \underline{-6 \quad -6} \\
 2x = 24 \\
 \underline{\quad \quad 2 \quad 2} \\
 x = 12
 \end{array}$$

$x = 12$? 

$$\begin{array}{r}
 \frac{1}{3}(6x - 15) = 3 \quad 4? \\
 \frac{1}{3} \cdot 6x - \frac{1}{3} \cdot 15 = 3 \\
 2x - 5 = 3 \\
 \underline{\quad \quad +5 \quad +5} \\
 2x = 8 \\
 \underline{\quad \quad 2 \quad 2} \\
 x = 4
 \end{array}$$

$$5 - x - 2 = 3 + 4x + 5$$

$$\begin{array}{r} -x + 3 = 4x + 8 \\ +x \qquad \qquad +x \\ \hline \end{array}$$

$$\begin{array}{r} 3 = 5x + 8 \\ -8 \qquad \qquad -8 \\ \hline \end{array}$$

$$\begin{array}{r} -5 = 5x \\ \frac{-5}{5} = \frac{5x}{5} \end{array}$$

$$-1 = x \rightarrow \boxed{x = -1}$$

$$3m - 10 = 2(4m - 5)$$

$$\begin{array}{r} 3m - 10 = 8m - 10 \\ -3m \qquad \qquad -3m \\ \hline \end{array}$$

$$\begin{array}{r} -10 = 5m - 10 \\ +10 \qquad \qquad +10 \\ \hline \end{array}$$

$$\begin{array}{r} 0 = 5m \\ \frac{0}{5} = \frac{5m}{5} \end{array}$$

$$0 = m$$

$$\boxed{m = 0}$$

Solve for x: $4(x+2)=3x+10$

$$\begin{array}{r}
 4x+8=3x+10 \\
 -4x \quad -4x \\
 \hline
 8=-x+10 \\
 -8 \quad -8 \\
 \hline
 0=-x+2 \\
 +x \quad +x \\
 \hline
 \boxed{x=2}
 \end{array}$$

Solve for x: $4x+10=2(x+5)$

$$\begin{array}{r}
 4x+10=2x+10 \\
 -2x \quad -2x \\
 \hline
 2x+10=10 \\
 -10 \quad -10 \\
 \hline
 2x=0 \\
 \frac{2x}{2}=\frac{0}{2} \\
 \boxed{x=0}
 \end{array}$$

Guided Practice

$$1. n + \frac{1}{4} = \frac{3}{4}$$

$$\frac{-\frac{1}{4} \quad -\frac{1}{4}}{\quad}$$

$$n = \frac{2}{4}$$

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

$$2. y = x + z \text{ Solve for } x$$

$$\frac{-z \quad -z}{\quad}$$

$$y - z = x$$

$$x = y - z$$

$$3. x + 2.5 = 7$$

$$\frac{-2.5 \quad -2.5}{\quad}$$

$$x = 4.5$$

$$4-1-8$$

$$4. \quad 4b - b - 8b = 12$$

$$\frac{-5b = 12}{-5 \quad -5}$$

$$b = -\frac{12}{5} = -2.4$$

$$5. \quad \frac{m}{8} - 2 = 5$$

$$\frac{\quad + 2 \quad + 2}{8 \cdot \frac{m}{8} = 7 \cdot 8}$$

$$m = 56$$

$$6. \quad -6(3x - 8) = -6$$

$$\begin{array}{r} -18x + 48 = -6 \\ -48 \quad -48 \end{array}$$

$$\frac{-18x = -54}{-18 \quad -18}$$

$$x = 3$$

7. Three-fifths of the students on a school trip are boys. There are 33 boys on the trip. How many students are on the trip?

$$\frac{3}{5}s = b$$

~~$$\frac{3}{5}s = 33 \cdot \frac{5}{3}$$~~

$$s = 55 \text{ students}$$