

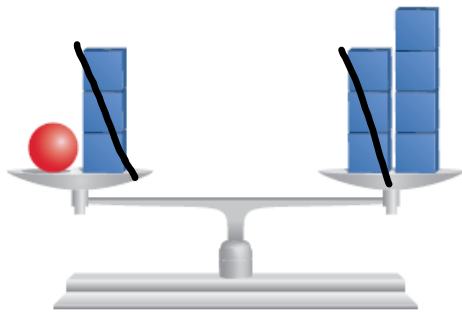
Lesson 3.3

Solving Equations Using Addition or Subtraction

Essential Question

How can you solve addition or subtraction equations?

**The Golden Rule! What you do to one side,
you must do to the other.**



$$x + 3 = 7$$

How many ■s is one ● worth?

How could you represent this situation with an equation?
(Hint: the ● is the variable and each ■ is 1.)

Solve the equation.

$$x = 4$$

Key Ideas

3.3 Notes

Get out your spiral notebooks!

Addition Property of Equality

Words Adding the same number to each side of an equation produces an equivalent equation.

Algebra If $a = b$, then $a + c = b + c$.

Subtraction Property of Equality

Words Subtracting the same number from each side of an equation produces an equivalent equation.

Algebra If $a = b$, then $a - c = b - c$.

Example 1:a. Solve $x - 5 = -1$.

$$\begin{array}{r|l} +5 & +5 \\ \hline x & = 4 \end{array}$$

Draw a "wall" down the middle so that you keep the equation balanced.

Check

$$4 - 5 = -1 \quad \checkmark$$

b. Solve $z + \frac{3}{2} = \frac{1}{2}$.

$$\begin{array}{r|l} -\frac{3}{2} & -\frac{3}{2} \\ \hline z & = -\frac{2}{2} \\ z & = -1 \end{array}$$

Check

$$-1 + \frac{3}{2} = \frac{1}{2}$$

$$-\frac{2}{2} + \frac{3}{2} = \frac{1}{2} \quad \checkmark$$

Solve the equation. Check your solution.

1. $p - 5 = -2$

$$\begin{array}{r|l} +5 & +5 \\ \hline p & = 3 \end{array}$$

$$3 - 5 = -2 \quad \checkmark$$

2. $w + 13.2 = 10.4$

$$\begin{array}{r|l} -13.2 & -13.2 \\ \hline w & = -2.8 \end{array}$$

$$\begin{array}{r} \cancel{13.2} \\ -10.4 \\ \hline 2.8 \end{array}$$

$$-2.8 + 13.2 = 10.4 \quad \checkmark$$

$$\begin{array}{r} \cancel{13.2} \\ -2.8 \\ \hline 10.4 \end{array}$$

3. $x - \frac{5}{6} = -\frac{1}{6}$

$$\begin{array}{r|l} +\frac{5}{6} & +\frac{5}{6} \\ \hline x & = \frac{4}{6} \end{array}$$

$$x = \frac{2}{3}$$

$$\frac{2 \cdot 2}{3 \cdot 2} - \frac{5}{6} = \frac{4}{6} - \frac{5}{6}$$

$$= -\frac{1}{6} \quad \checkmark$$

Example 2:

A company has a profit of \$750 this week. This profit is \$900 more than the profit P last week. Which equation can be used to find P ?

$$750 = P + 900$$

A. $750 = 900 - P$

B. $750 = P + 900$

C. $900 = P - 750$

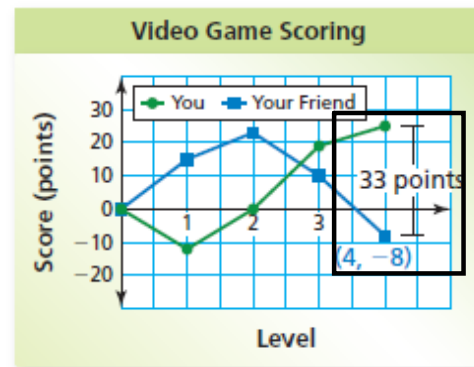
D. $900 = P + 750$

4. A company has a profit of \$120.50 today. This profit is \$145.25 less than the profit P yesterday. Write an equation that can be used to find P .

$$120.50 = P - 145.25$$

Example 3:

The line graph shows the scoring while you and your friend played a video game. Write and solve an equation to find your score after Level 4.



Your friend's score is 33 points less than your score.

$$\begin{array}{r}
 F = Y - 33 \\
 -8 = Y - 33 \\
 +33 \quad | \quad +33 \\
 \hline
 25 = Y
 \end{array}$$

Looking at the graph, 25 points makes sense

5. WHAT IF? You have -12 points after Level 1. Your score is 27 points less than your friend's score. What is your friend's score?

your score is 27 less than friend's score

$$\begin{array}{r}
 -12 = F - 27 \\
 +27 \quad | \quad +27 \\
 \hline
 15 = F
 \end{array}$$

Looking at the graph, 15 points makes sense

