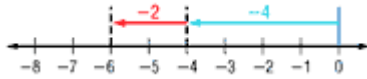


Lesson 2-2

Example 1 Add Integers on a Number Line

Find the sum $-4 + (-2)$.



Start at zero.

Move 4 units to the left.

From there, move 2 more units to the left.

$$-4 + (-2) = -6$$

Example 2 Add Integers with the Same Sign

Find $-6 + (-3)$.

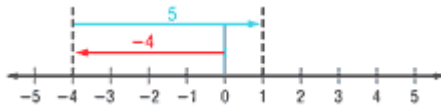
$$-6 + (-3) = -9$$

Add $|-6|$ and $|-3|$. Both numbers are negative, so the sum is negative.

Example 3 Add Integers on a Number Line

Find each sum.

a. $-4 + 5$



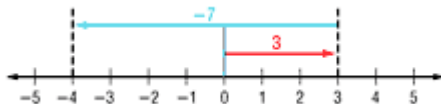
Start at zero.

Move 4 units to the left.

From there, move 5 units to the right.

$$-4 + 5 = 1$$

b. $3 + (-7)$



Start at zero.

Move three units to the right.

From there, move 7 units to the left.

$$3 + (-7) = -4$$

Example 4 Add Integers with Different Signs

Find each sum.

a. $-6 + 9$

To find $-6 + 9$, subtract $|-6|$ from $|9|$. The sum is positive because $|9| > |-6|$.

$$-6 + 9 = 3$$

b. $2 + (-7)$

To find $2 + (-7)$, subtract $|2|$ from $|-7|$. The sum is negative because $|-7| > |2|$.

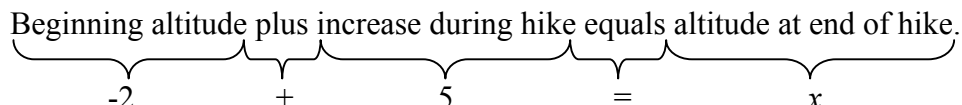
$$2 + (-7) = -5$$

Example 5 Use Integers to Solve Problems

HIKING Emily begins a hike at an altitude of 2 miles below sea level. As she hikes, she goes up in altitude 5 miles. When Emily finishes her hike, what is her altitude?

Words The beginning altitude is 2 miles below sea level. She goes up in altitude 5 miles. What is her altitude at the end of the hike?

Variables Let x = altitude at the end of the hike.

Equation 

Solve the equation.

$$-2 + 5 = x \quad \text{To find the sum, subtract } |-2| \text{ from } |5|.$$

$$3 = x \quad \text{The sum is positive because } |5| > |-2|.$$

Emily's final altitude is 3 miles above sea level.

Example 6 Add Three or More Integers

Find each sum.

a. $5 + (-3) + 4$

$$\begin{aligned} 5 + (-3) + 4 &= 5 + 4 + (-3) && \text{Commutative Property} \\ &= 9 + (-3) && \text{Simplify.} \\ &= 6 && \text{Simplify.} \end{aligned}$$

b. $-3 + 9 + (-5) + 4$

$$\begin{aligned} -3 + 9 + (-5) + 4 &= -3 + (-5) + 9 + 4 && \text{Commutative Property} \\ &= [-3 + (-5)] + (9 + 4) && \text{Associative Property} \\ &= -8 + 13 && \text{Simplify.} \\ &= 5 && \text{Simplify.} \end{aligned}$$