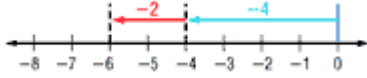


## Lesson 2-2

### 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  $-6 + (-3)$ .

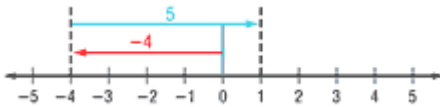
$$-6 + (-3) = -9$$

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.  $-4 + 5$



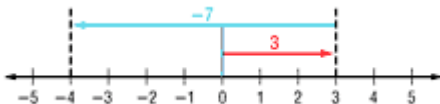
Start at zero.

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** Beginning altitude plus increase during hike equals altitude at end of hike.

$$-2 + 5 = x$$

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

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