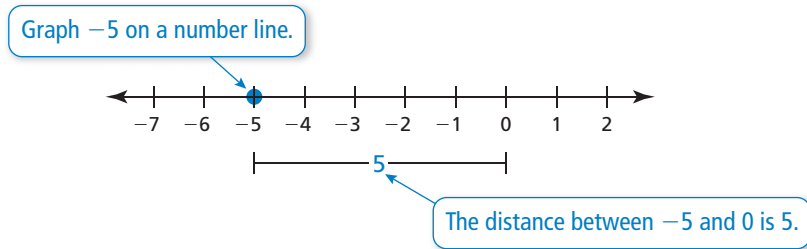


# Operations with Integers

## Adding and Subtracting Integers

The **absolute value** of an integer is the distance between the number and 0 on a number line. The absolute value of a number  $x$  is written as  $|x|$ .

**Example 1** Find the absolute value of  $-5$ .



► So,  $|-5| = 5$ .

Rules for Adding and Subtracting Integers	
<b>Adding:</b>	To add integers with the <i>same</i> sign, add the absolute values of the integers. Then use the common sign.  To add integers with <i>different</i> signs, subtract the lesser absolute value from the greater absolute value. Then use the sign of the integer with the greater absolute value.
<b>Subtracting:</b>	To subtract an integer, add its opposite.

**Example 2** Find (a)  $-3 + (-8)$  and (b)  $-9 + 6$ .

a.  $-3 + (-8) = -11$  Add  $|-3|$  and  $|-8|$ .  
Use the common sign.

► The sum is  $-11$ .

b.  $-9 + 6 = -3$   $|-9| > |6|$ . So, subtract  $|6|$  from  $|-9|$ .  
Use the sign of  $-9$ .

► The sum is  $-3$ .

**Example 3** Find (a)  $5 - (-12)$  and (b)  $1 - 7$ .

a.  $5 - (-12) = 5 + 12$  Add the opposite of  $-12$ .  
 $= 17$  Add.

► The difference is  $17$ .

b.  $1 - 7 = 1 + (-7)$  Add the opposite of  $7$ .  
 $= -6$  Add.

► The difference is  $-6$ .

**Example 4** Simplify  $|-14 - (-10)|$ .

$$\begin{aligned} -14 - (-10) &= |-14 + 10| && \text{Add the opposite of } -10. \\ &= |-4| && \text{Add.} \\ &= 4 && \text{Find the absolute value.} \end{aligned}$$

► So,  $|-14 - (-10)| = 4$ .

# Operations with Integers

## Multiplying and Dividing Integers

Rules for Multiplying and Dividing Integers
<b>Multiplying and Dividing:</b> The product or quotient of two integers with the <i>same</i> sign is <i>positive</i> . The product or quotient of two integers with <i>different</i> signs is <i>negative</i> .

**Example 5** Find (a)  $-7 \cdot (-1)$  and (b)  $-9 \cdot 4$ .

a.  $-7 \cdot (-1) = 7$  The integers have the same sign, so the product is positive.

▶ The product is 7.

b.  $-9 \cdot 4 = -36$  The integers have different signs, so the product is negative.

▶ The product is  $-36$ .

**Example 6** Find (a)  $18 \div (-2)$  and (b)  $-25 \div (-5)$ .

a.  $18 \div (-2) = -9$  The integers have different signs, so the quotient is negative.

▶ The quotient is  $-9$ .

b.  $-25 \div (-5) = 5$  The integers have the same sign, so the quotient is positive.

▶ The quotient is 5.

## Practice

Check your answers at [BigIdeasMath.com](http://BigIdeasMath.com).

Find the absolute value.

1.  $|13|$  13      2.  $|-8|$  8      3.  $|0|$  0      4.  $|-297|$  297

Evaluate.

5.  $5 + (-11)$   $-6$       6.  $4 - 9$   $-5$       7.  $-15 + (-10)$   $-25$       8.  $9 + (-6)$  3  
 9.  $0 - (-50)$  50      10.  $-8 + 20$  12      11.  $-11 - 11$   $-22$       12.  $-14 + 0$   $-14$   
 13.  $20 - (-21)$  41      14.  $-34 - (-25)$   $-9$       15.  $-8 + (-3) + 6$   $-5$       16.  $1 + 7 - 9$   $-1$

Simplify the expression.

17.  $|-15 - 9|$  24      18.  $|18 - (-11)|$  29      19.  $|-14 + 17|$  3      20.  $|-24 - (-19)|$  5

Evaluate.

21.  $-8 \cdot 25$   $-200$       22.  $-33 \div (-3)$  11      23.  $-13(-1)$  13      24.  $-24 \div 4$   $-6$   
 25.  $0(-4)$  0      26.  $-15(8)$   $-120$       27.  $\frac{0}{-12}$  0      28.  $-1(-1)$  1  
 29.  $\frac{-16}{-1}$  16      30.  $240 \div (-8)$   $-30$       31.  $5 \cdot (-7) \cdot (-4)$  140      32.  $12 \div (-3) \cdot 2$   $-8$

33. **ELEVATION** The highest elevation in California is 14,494 feet, on Mount Whitney. The lowest elevation in California is  $-282$  feet in Death Valley. Find the range of elevations in California. 14,776 ft

34. **GOLF** The table shows a golfer's score for each round of a tournament. Find the golfer's total score and the golfer's mean score per round.

$-6; -2$

	Round 1	Round 2	Round 3
Score	-3	-4	+1