

# Multiplying Rational Numbers

(Pages 140–145)

The product of two numbers having the *same sign* is positive. The product of two numbers having *different signs* is negative. It is also useful to note that multiplying a number or expression by  $-1$  results in the opposite of the number or expression. This is called the **multiplicative property of  $-1$** .

## Multiplying Fractions

To multiply fractions, multiply the numerators and multiply the denominators.

$$\frac{a}{b} \cdot \frac{c}{d} = \frac{ac}{bd}, \text{ where } b, d \neq 0$$

## EXAMPLES

**A** Find  $-7\frac{3}{4}\left(\frac{1}{6}\right)$ .

$$-7\frac{3}{4}\left(\frac{1}{6}\right) = -\frac{31}{4} \cdot \frac{1}{6}$$

$$= -\frac{31 \cdot 1}{4 \cdot 6}$$

$$= -\frac{31}{24} \text{ or } -1\frac{7}{24}$$

Rewrite  $-7\frac{3}{4}$  as an improper fraction.  
Multiply numerators and multiply denominators.

The signs are different, so the product is negative.

**B** Simplify  $3.2m(1.5n)$ .

$$3.2m(1.5n)$$

$$= (3.2)(m)(1.5)(n)$$

$$= (3.2)(1.5)(m)(n)$$

$$= (3.2 \cdot 1.5)(m \cdot n)$$

$$= 4.8mn$$

Rewrite  $3.2m(1.5n)$ .

Commutative Property

Associative Property

Simplify.

## PRACTICE

Find each product.

1.  $-3.7(-4)$

2.  $5.2(-0.5)$

3.  $(-2.8)(-1.5)$

4.  $6 \cdot (-9.3)$

5.  $-3.5 \cdot (1.6)$

6.  $-8.7 \cdot 4$

7.  $-\frac{1}{4}\left(-\frac{2}{5}\right)$

8.  $5 \cdot \frac{1}{3}$

9.  $\frac{2}{3}\left(-\frac{5}{6}\right)$

10.  $-\frac{3}{4} \cdot \left(-3\frac{1}{2}\right)$

11.  $-\frac{5}{8}(-2)$

12.  $1\frac{5}{6}\left(-\frac{2}{7}\right)$

Simplify each expression.

13.  $-7.5a(1.2b)$

14.  $-8p(-5.4q)$

15.  $\frac{3}{4}g\left(-\frac{2}{3}h\right)$

16.  $-\frac{7}{9}c(-4d)$



**17. Standardized Test Practice** The velocity of an object  $t$  seconds after the object is dropped from the top of a tall building is about  $-9.8t$  meters per second (m/s). What is its velocity 2.5 seconds after it is dropped?

**A**  $-24.5$  m/s

**B**  $-7.3$  m/s

**C**  $7.3$  m/s

**D**  $18.4$  m/s

Answers: 1. 14.8 2. -2.6 3. 4.2 4. -55.8 5. -5.6 6. -34.8 7.  $\frac{10}{1}$  8.  $1\frac{3}{2}$  9.  $-\frac{9}{5}$  10.  $2\frac{8}{5}$  11.  $1\frac{4}{1}$  12.  $-\frac{21}{11}$  13.  $-9ab$  14.  $43.2pq$  15.  $-\frac{2}{1}gh$  16.  $3\frac{2}{9}cd$  17. A