

## Lesson 2-4

### Example 1 Divide Integers. Find each quotient.

a.  $-34 \div -17$

$$-34 \div -17 = 2 \quad \text{positive quotient}$$

b.  $\frac{72}{-12}$

$$\frac{72}{-12} = 72 \div -12 \quad \text{Divide}$$
$$= -6 \quad \text{negative quotient}$$

### Example 2 Simplify Before Dividing

Simplify  $\frac{4 - (7 - (-9))}{6(3 + (-2))}$ .

$$\frac{4 - (7 - (-9))}{6(3 + (-2))} = \frac{4 - (16)}{6(3 + (-2))} \quad \text{Simplify the numerator first.}$$
$$= \frac{-12}{6(3 + (-2))} \quad \text{Subtract.}$$
$$= \frac{-12}{6(1)} \quad \text{Simplify the denominator.}$$
$$= \frac{-12}{6} \text{ or } -2 \quad \text{different signs} \rightarrow \text{negative quotient}$$

### Example 3 Divide Rational Numbers Find each quotient.

a.  $-171.52 \div 13.4$

$$-171.52 \div 13.4 = -12.8 \quad \text{different signs} \rightarrow \text{negative quotient}$$

b.  $\frac{1}{3} \div \left(-\frac{5}{7}\right)$

$$\frac{1}{3} \div \left(-\frac{5}{7}\right) = \frac{1}{3} \cdot \left(-\frac{7}{5}\right) \quad \text{Multiply by } -\frac{7}{5}, \text{ the reciprocal of } -\frac{5}{7}.$$

$$= -\frac{7}{15} \quad \text{different signs} \rightarrow \text{negative quotient}$$

### Example 4 Divide Rational Numbers to Solve a Problem

The temperature dropped 20 degrees between 9 pm and 5 am. If the temperature dropped the same number of degrees each hour, what was the change in temperature for each hour?

To find the change each hour, divide the total change in degrees by the total hours.

$$-20 \div 8 = -2.5 \quad -20 \text{ equals the temperature change, } 8 \text{ represents the hours between 9 pm and 5 am}$$

different signs  $\rightarrow$  negative quotient

The temperature changed  $-2.5$  degrees each hour.

**Example 5 Simplify Algebraic Expressions****Simplify  $\frac{10 - 5x}{-5}$ .**

$$\begin{aligned}\frac{10 - 5x}{-5} &= (10 - 5x) \div (-5) && \text{The fraction bar indicates division.} \\ &= (10 - 5x) \left(-\frac{1}{5}\right) && \text{Multiply by } \left(-\frac{1}{5}\right), \text{ the reciprocal of } -5. \\ &= 10 \left(-\frac{1}{5}\right) - 5x \left(-\frac{1}{5}\right) && \text{Distributive Property} \\ &= -2 + x && \text{Simplify.}\end{aligned}$$

**Example 6 Evaluate Algebraic Expressions****Evaluate  $\frac{x^2 - y}{z}$  if  $x = 0.5$ ,  $y = -0.75$ , and  $z = -0.8125$ . Round to the nearest hundredth.**

$$\begin{aligned}\frac{x^2 - y}{z} &= \frac{(0.5)^2 - (-0.75)}{-0.8125} && \text{Replace } x \text{ with } 0.5, y \text{ with } -0.75, \text{ and } z \text{ with } -0.8125. \\ &= \frac{0.25 + 0.75}{-0.8125} && \text{Simplify the numerator.} \\ &= \frac{1}{-0.8125} && \text{Add.} \\ &= 1 \div -0.8125 && \text{Divide.} \\ &\approx -1.23 && \text{different signs } \rightarrow \text{negative quotient}\end{aligned}$$