

## Dividing Integers

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### What You'll Learn

To divide integers and to solve problems by dividing integers



### Check Skills You'll Need

#### 1. Vocabulary Review

The *product* of two negative integers is always ?.

Find each product.

2.  $-4 \times (-4)$

### Why Learn This?

Many professionals, such as stockbrokers and meteorologists, use rates of change. You can find a rate of change by dividing integers.

The rules for finding the sign of a quotient when dividing integers are similar to the rules for multiplying integers.



*Please copy this into your notes.*

**KEY CONCEPTS** **Dividing Integers**

The quotient of two integers with the same sign is positive.  
The quotient of two integers with different signs is negative.

**Examples:**       $20 \div 4 = 5$        $20 \div (-4) = -5$   
                     $-20 \div (-4) = 5$        $-20 \div 4 = -5$

**EXAMPLE** **Dividing Integers**

**1** a. Find  $-15 \div (-3)$ .

$-15 \div (-3) = 5$  ← same signs, positive quotient

b. Find  $-24 \div 8$ .

$-24 \div 8 = -3$  ← different signs, negative quotient

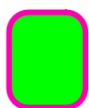
**1** EXAMPLE Find each quotient.

a.  $-33 \div (-3)$

$-33 \div (-3) = 11$  ← same signs, positive quotient

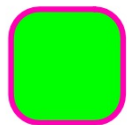
b.  $24 \div (-6)$

$24 \div (-6) = -4$  ← different signs, negative quotient



1. Find the quotient of  $-24 \div 6$ .

- A. 4
- B. 18
- C. -4
- D. -18



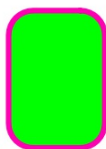
2. Find the quotient of  $-36 \div (-2)$ .

A. -34

B. -18

C. -38

D. 18



3. Find the quotient of  $48 \div (-12)$ ?

A. 3

B. 4

C. -3

D. -4



**Careers** Meteorologists analyze and predict changes in the weather.


## EXAMPLE Application: Weather

**2 Multiple Choice** The temperature changed from  $0^{\circ}\text{C}$  to  $-56^{\circ}\text{C}$  in four hours. Find the average rate of change in degrees per hour.

- (A)  $-52$       (B)  $-14$       (C)  $14$       (D)  $52$

$$-56 \div 4 = -14 \quad \leftarrow \text{different signs, negative quotient}$$

The average rate of change is  $-14^{\circ}\text{C}$  per hour.

 The correct answer is choice B.

**2 EXAMPLE** In a 2-hour period, the wind speed decreased from 28 mph to 18 mph. If the speed decreased the same amount each hour, how much did the wind speed change each hour?

**Words**      total change      divided by      number of hours      equals      change per hour



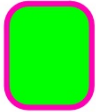
Let  $r$  = the average change per hour.

**Equation**      -10       $\div$       2      =      r

$$-10 \div 2 = r$$

$$-5 = r \quad \leftarrow \text{Simplify.}$$

The wind speed changed at an average rate of  $-5$  mph each hour.



1. The value of one share of stock decreased \$20 over the last five days. What is the average rate of change in dollars per day?
- A. -\$3 per day
  - B. -\$4 per day
  - C. -\$5 per day
  - D. -\$2 per day

### Check Your Understanding

1. **Error Analysis** Who found the correct quotient? Explain.

Zarita  
 $-6 \div (-2) = 3$

Zurina  
 $-6 \div (-2) = -3$

2. **Writing in Math** Explain how you know without computing that the quotient  $-400 \div 25$  is less than 0.
3. Over three hours, the temperature decreased  $6^\circ$ . Find the average rate of change in degrees per hour.

**Tell whether each quotient is *positive* or *negative*.**

4.  $-24 \div (-3)$

5.  $30 \div (-10)$

6.  $-81 \div 9$

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