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: $20 \div 4 = 5$ $\quad 20 \div (-4) = -5$
$-20 \div (-4) = 5$ $\quad -20 \div 4 = -5$

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 2 Application: Weather

Multiple Choice The temperature changed from 0°C to −56°C in four hours. Find the average rate of change in degrees per hour.

(A) −52 (B) −14 (C) 14 (D) 52

$-56 \div 4 = -14$ ← different signs, negative quotient

The average rate of change is −14°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 $-10 \div 2 = r$

$-5 = r$ ← 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	Zurina
$-6 \div (-2) = 3$	$-6 \div (-2) = -3$

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°. 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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