

2.6 Divide Real Numbers



TEKS

a.1, a.6,
A.4.B; 8.2.B

Before

You multiplied real numbers.

Now

You will divide real numbers.

Why?

So you can calculate volleyball statistics, as in Ex. 57.

Key Vocabulary

- **multiplicative inverse**
- **reciprocal**, p. 915
- **mean**, p. 918

Reciprocals like $\frac{2}{3}$ and $\frac{3}{2}$ have the property that their product is 1:

$$\frac{2}{3} \cdot \frac{3}{2} = 1$$

The reciprocal of a nonzero number a , written $\frac{1}{a}$, is called the **multiplicative inverse** of a . Zero does not have a multiplicative inverse because there is no number a such that $0 \cdot a = 1$.

KEY CONCEPT

For Your Notebook

Inverse Property of Multiplication

Words The product of a nonzero number and its multiplicative inverse is 1.

Algebra $a \cdot \frac{1}{a} = \frac{1}{a} \cdot a = 1, a \neq 0$

Example $8 \cdot \frac{1}{8} = 1$

EXAMPLE 1 Find multiplicative inverses of numbers

- The multiplicative inverse of $-\frac{1}{5}$ is -5 because $-\frac{1}{5} \cdot (-5) = 1$.
- The multiplicative inverse of $-\frac{6}{7}$ is $-\frac{7}{6}$ because $-\frac{6}{7} \cdot \left(-\frac{7}{6}\right) = 1$.

WRITE INVERSES

You can find the inverse

of $-\frac{6}{7}$ as follows:

$$\begin{aligned} \frac{1}{-\frac{6}{7}} \cdot 1 &= \frac{1}{-\frac{6}{7}} \cdot \frac{7}{7} \\ &= -\frac{7}{6} \end{aligned}$$

DIVISION Because the expressions $4 \div \frac{2}{3}$ and $4 \cdot \frac{3}{2}$ have the same value, 6, you can conclude that $4 \div \frac{2}{3} = 4 \cdot \frac{3}{2}$. This example illustrates the *division rule*.

KEY CONCEPT

For Your Notebook

Division Rule

Words To divide a number a by a nonzero number b , multiply a by the multiplicative inverse of b .

Algebra $a \div b = a \cdot \frac{1}{b}, b \neq 0$ **Example** $5 \div 2 = 5 \cdot \frac{1}{2}$