

**EXAMPLE**

Eight pounds of flour are divided into  $\frac{1}{5}$ -pound bags. How many bags are needed to hold all the flour?

From each pound of flour, we can make five  $\frac{1}{5}$ -pound bags, so from eight pounds of flour, we can make  $8 \times 5 = \mathbf{40}$  bags.

**PRACTICE**

Answer each question below.

- 114.** The Burger Palace orders a box that contains 12 pounds of hamburger patties. Each patty weighs  $\frac{1}{3}$  of a pound. How many patties are in the box? **114.** \_\_\_\_\_
- 115.** One lap around the track at Kayla's school is  $\frac{1}{5}$  of a mile. Kayla runs 7 miles around the track. How many laps does Kayla run? **115.** \_\_\_\_\_
- 116.** Captain Kraken has sheets of plywood that are  $\frac{1}{4}$  inches thick. A stack of these plywood sheets is 18 inches tall. How many sheets are in the stack? **116.** \_\_\_\_\_
- 117.** A regular polygon whose sides are  $\frac{1}{5}$  of an inch long has a perimeter of 4 inches. How many sides does the polygon have? **117.** \_\_\_\_\_
- 118.** The Beast Island Candy Shop makes 50 pounds of peppermint bark candy. The candy makers split the bark into  $\frac{1}{8}$ -pound bags, which are each sold for \$6. How much money will the shop collect if they sell every bag of peppermint bark? **118.** \_\_\_\_\_

The **reciprocal** of a number  $n$  is the number we multiply  $n$  by to get 1.

**EXAMPLE**

What is the reciprocal of 7?

$7 \times \frac{1}{7} = 1$ , so 7 and  $\frac{1}{7}$  are reciprocals.

$\frac{1}{7}$  is the reciprocal of 7.

**PRACTICE**

Find the reciprocal of each number or expression below.

119.  $\frac{1}{5}$

Reciprocal: \_\_\_\_\_

120. 17

Reciprocal: \_\_\_\_\_

121.  $5+6$

Reciprocal: \_\_\_\_\_

122.  $6 \times 9$

Reciprocal: \_\_\_\_\_

123.  $\frac{15}{3}$

Reciprocal: \_\_\_\_\_

124.  $\frac{13}{39}$

Reciprocal: \_\_\_\_\_

125. Does 0 have a reciprocal? If so, what is it? If not, explain why not.



126. Write an expression for the reciprocal of  $n$ .  
(Assume that  $n$  is not zero.)

126. \_\_\_\_\_

127. Write an expression for the reciprocal of  $\frac{1}{a}$ .  
(Assume that  $a$  is not zero.)

127. \_\_\_\_\_

128. Write an expression for the reciprocal of  $c+1$ .  
(Assume that  $c$  is not -1.)

128. \_\_\_\_\_

129. What is the sum of the reciprocals of  $\frac{1}{5}$  and  $\frac{1}{7}$ ?

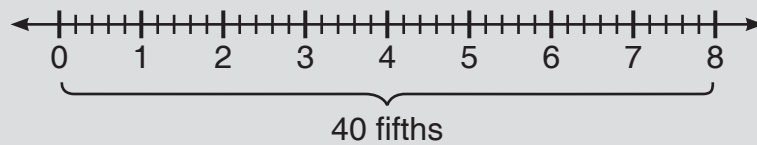
129. \_\_\_\_\_

**EXAMPLE**What is  $8 \div \frac{1}{5}$ ?

We consider dividing 8 pounds of flour into  $\frac{1}{5}$ -pound bags. From each pound of flour, we can make five  $\frac{1}{5}$ -pound bags, so from eight pounds of flour, we can make  $8 \times 5 = \mathbf{40}$  bags.

— or —

We look at the number line to find out how many  $\frac{1}{5}$ 's are in 8. Since there are 5 fifths in 1, there are  $8 \times 5 = \mathbf{40}$  fifths in 8.



We write  $8 \div \frac{1}{5} = 8 \times 5 = \mathbf{40}$ .

**Dividing by a number is the same as multiplying by its reciprocal.**

Dividing by  $n$  is the same as multiplying by the **reciprocal** of  $n$ .

For example,  $9 \div 4 = 9 \times \frac{1}{4} = \frac{9}{4}$ , and  $5 \div \frac{1}{7} = 5 \times 7 = 35$ .

**PRACTICE**

To compute each quotient below, multiply by the reciprocal. Write your answers in simplest form.

130.  $5 \div \frac{1}{7} =$

131.  $3 \div \frac{1}{16} =$

132.  $9 \div \frac{1}{4} =$

133.  $\frac{1}{16} \div \frac{1}{8} =$

# FRACTIONS

*Division by Unit Fractions*

**PRACTICE**

Write each quotient below in simplest form.

134.  $3\frac{2}{11} \div \frac{1}{2} =$

135.  $2\frac{1}{5} \div \frac{1}{8} =$

136.  $5 \div (3 \div \frac{1}{12}) =$

137.  $(5 \div 3) \div \frac{1}{12} =$

138.  $(9 \div \frac{1}{10}) \div \frac{1}{5} =$

139.  $9 \div (\frac{1}{10} \div \frac{1}{5}) =$

**PRACTICE**

Answer each question below.

140. How many  $\frac{1}{4}$ -cup scoops of flour are needed to equal  $2\frac{3}{4}$  cups?

140. \_\_\_\_\_

141. The tallest tree in Ranger Rick's forest grows  $\frac{1}{8}$  of an inch every week. How many weeks will it take for the tree to grow  $7\frac{3}{4}$  inches?

141. \_\_\_\_\_

142. Tara brought 4 gallons of water on a hike. She gave  $\frac{1}{3}$  of a gallon to each of her hiking companions, which left her with  $1\frac{1}{3}$  gallons of water. How many companions were on the hike with Tara?

142. \_\_\_\_\_

143. If  $a \div \frac{1}{16} = 20$ , what is the value of  $a$ ?

143. \_\_\_\_\_

