

# Topic 9 Study Guide

## • Fractions as Division

$$2 \div 3 \rightarrow \frac{2}{3} \quad 25 \div 75 \rightarrow \frac{25 \div 25}{75 \div 25} = \frac{1}{3}$$

## • Fractions & Mixed Numbers as Quotients

Split 4 pounds among 3 people

$$4 \div 3 \rightarrow \frac{4}{3} \rightarrow 1\frac{1}{3} \quad \text{Each person got } 1\frac{1}{3} \text{ pound}$$

## • Whole number $\div$ Fraction

4 pound package is divided into  $\frac{1}{4}$  pound packages. How many  $\frac{1}{4}$  pound packages are there?

$$4 \div \frac{1}{4}$$

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$$\frac{4}{1} \times \frac{4}{1} = \frac{16}{1} = 16$$

Division is the same thing as multiplying by the reciprocal

- Keep the first number the same

- Change the sign to multiplication

There are 16  $\frac{1}{4}$  pound packages

Flip (reciprocal)

why does this work?

$$12 \div 4 = 3 \quad \checkmark$$

$$\frac{12}{1} \times \frac{1}{4} = \frac{12}{4} = 3 \quad \checkmark$$

same thing  
☺

## Fraction $\div$ Whole Number

Mrs. Covey has  $\frac{1}{6}$  of a pan of brownies left over from a party. She wants to divide what she has left between her two children. What fraction of the original pan of brownies will each child get?

		Piper	Charlie
$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$
$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$
$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$

$$\frac{1}{6} \div 2$$

↓ ↓ ↓

$$\frac{1}{6} \times \frac{1}{2} = \frac{1}{12}$$

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Each child gets  $\frac{1}{12}$

## Reasoning

(A)  $\frac{1}{4} \div 6 = \frac{1}{24}$

or (B)  $6 \div \frac{1}{4} = 24$

1. Charlie has  $\frac{1}{4}$  pound of candy. She plans to divide it evenly between six people. How much will each person get?

A. Dividing the  $\frac{1}{4}$  pound of candy so each person gets  $\frac{1}{24}$  pound

2. Charlie has 6 pounds of candy. She plans to divide it into  $\frac{1}{4}$  pound bags. How many bags will she have?

B. Dividing 6 pounds so, there will be 24 bags!



Name \_\_\_\_\_

1. If the diameter of a tree trunk is growing  $\frac{1}{4}$  inch each year, how many years will it take for the diameter to grow 8 inches?

- (A) 2 years
- (B) 8 years
- (C) 24 years
- (D) 32 years

$$8 \div \frac{1}{4}$$

$$8 \times 4 = 32$$

2. For questions 2a–2d, choose Yes or No to tell if the number 4 will make each equation true.

2a.  $1 \div 4 = \boxed{4}$   Yes  No

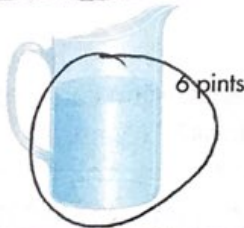
2b.  $5 \div \boxed{4} = \frac{4}{5}$   Yes  No

2c.  $\boxed{4} \div 7 = \frac{4}{7}$   Yes  No

2d.  $2 \div \boxed{4} = \frac{1}{2}$   Yes  No

$$\frac{2}{4} = \frac{1}{2}$$

3. Mrs. Webster wants to divide the milk shown into  $\frac{1}{3}$ -pint servings. How many servings are possible?

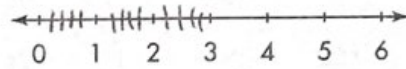


$$6 \div \frac{1}{3} = 6 \times 3 = 18 \text{ servings}$$

4. How many  $\frac{1}{8}$ s are in 25?

$$25 \div \frac{1}{8} = 25 \times 8 = 200$$

5. Raven is making pillows. She needs  $\frac{1}{5}$  yard of fabric for each pillow. If she has 6 yards of fabric, how many pillows can she make? Use the number line.



- (A)  $\frac{1}{30}$  pillow
- (B)  $\frac{7}{5}$  pillows
- (C) 11 pillows
- (D) 30 pillows

$$6 \div \frac{1}{5} = 6 \times 5 = 30$$

6. A farmer owns 24 acres of land. He plans to use 6 acres for an entrance into the farm and partition the remaining land into  $\frac{1}{3}$ -acre lots. How many  $\frac{1}{3}$ -acre lots will he have?

- (A) 6 lots
- (B) 18 lots
- (C) 54 lots
- (D) 72 lots

$$24 - 6 = 18$$

$$18 \div \frac{1}{3} = 18 \times 3 = 54$$

7. One half of a cantaloupe was shared equally among 3 people. What fraction of the whole cantaloupe did each person get? Explain how you found your answer.

$$\frac{1}{2} \div 3 = \frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$$

each person will get  $\frac{1}{6}$  of the cantaloupe

8. Draw lines to match each expression on the left to its quotient on the right.

1	$12 \div 5$	$\frac{12}{5} = 2\frac{2}{5}$	$\frac{5}{12}$	3
2	$12 \div \frac{1}{5}$	$12 \times 5 = 60$	60	2
3	$5 \div 12$	$\frac{5}{12}$	$\frac{1}{60}$	4
4	$\frac{1}{5} \div 12$	$\frac{1}{5} \times \frac{1}{12}$	$2\frac{2}{5}$	1

9. Choose all the expressions that are equal to  $\frac{1}{6}$ .

$6 \div 1$   $6 = 6$   
  $3 \div 18$   $\frac{3}{18} = \frac{1}{6}$   
  $2 \div \frac{1}{3}$   $2 \div \frac{1}{3} = 2 \times 3 = 6$   
  $1 \div 6$   $\frac{1}{6}$   
  $\frac{1}{3} \div 2$   $\frac{1}{3} \times \frac{1}{2} = \frac{1}{6}$

10. Cecil and three friends ran a 15-mile relay race. Each friend ran an equal distance. What distance did each friend run?

- (A)  $\frac{4}{15}$  mile  
 (B)  $3\frac{1}{4}$  miles  
 (C)  $3\frac{2}{3}$  miles  
 (D)  $3\frac{3}{4}$  miles

4 people  
15 mile race  
 $15 \div 4 = \frac{15}{4} = 3\frac{3}{4}$

11. Josie has a rug with an area of 18 square feet. She will put the rug on a floor that is covered in  $\frac{1}{3}$ -square-foot tiles. How many tiles will the rug cover?

$18 \div \frac{1}{3}$   
 $18 \times 3 = 54$  tiles

12. Ellen says that  $1\frac{2}{5}$  equals  $5 \div 7$ . Is she correct? Explain.

$\frac{5}{7} = \frac{5}{7}$  NO she is not correct  
 $1\frac{2}{5} = \frac{7}{5}$  because  $1\frac{2}{5} = \frac{7}{5}$   
 which can be written as  $\frac{14}{10} = \frac{7}{5}$

13. Corey has  $\frac{1}{4}$  yard of fabric. He cuts the fabric into 2 equal pieces. Write an expression for the number of yards of each piece of fabric.

$\frac{1}{4} \div 2$      $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$

14. Look at the equations below.

$8 \div \frac{1}{3} = 24$      $2 \div \frac{1}{9} = 18$   
 $8 \times 3 = 24$      $2 \times 9 = 18$

**Part A**

Write numbers in the boxes above to make each equation true.

**Part B**

What generalization can you make about the equations? Explain.

Dividing is the same as multiplying by the reciprocal  
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