Reciprocals

Reciprocals are two fractions that have a product of 1.

Fractions:

To find the reciprocal of a fraction, switch the numerator and denominator.

The reciprocal of $\frac{3}{8}$ is $\frac{8}{3}$.

$$\frac{3}{8} \times \frac{8}{3} = \frac{24}{24} = 1$$

Whole Numbers:

To find the reciprocal of a whole number, first write it as a fraction. Then switch the numerator and denominator.

$$7 = \frac{7}{1}.$$

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

Mixed Numbers:

To find the reciprocal of a mixed number, first write it as a fraction. Then switch the numerator and denominator.

$$5\frac{2}{3} = \frac{17}{3}$$

The reciprocal of $\frac{17}{3}$ is $\frac{3}{17}$.

Are the two numbers reciprocals? Write *yes* or *no*.

1. $\frac{1}{9}$ and 19

2. $\frac{3}{10}$ and $\frac{10}{3}$

3. $1\frac{3}{5}$ and $\frac{8}{5}$

4. 5 and $\frac{1}{5}$

_____   _____   _____   _____

5. $\frac{5}{13}$ and $2\frac{3}{5}$

6. $\frac{1}{10}$ and $\frac{1}{10}$

7. $2\frac{1}{4}$ and $\frac{4}{9}$

8. $\frac{7}{12}$ and $\frac{12}{7}$

_____   _____   _____   _____

Write the reciprocal of each number.

9. $\frac{1}{7}$

10. $\frac{5}{12}$

11. 6

12. $3\frac{5}{9}$

13. $\frac{6}{5}$

_____   _____   _____   _____   _____

14. $\frac{2}{11}$

15. 11

16. $1\frac{3}{8}$

17. $\frac{1}{2}$

18. 100

_____   _____   _____   _____   _____

Name _____

Divide Whole Numbers by Fractions

Beth is working on a science project. She needs pieces of wire that are $\frac{2}{3}$ yd long for the project. She bought a piece of wire that is 6 yd long at the hardware store.

How many $\frac{2}{3}$-yd pieces can she cut from this 6-yd piece?

Step 1: Write a division sentence to find this amount. $\qquad \frac{6}{1} \div \frac{2}{3}$ $\qquad$ **Think:** Write 6 as $\frac{6}{1}$.

Step 2: Use the reciprocal of the divisor to write a multiplication problem. $\qquad \frac{6}{1} \times \frac{3}{2}$ $\qquad$ **Think:** The reciprocal of $\frac{2}{3}$ is $\frac{3}{2}$.

Step 3: Multiply. $\qquad \frac{6}{1} \times \frac{3}{2} = \frac{18}{2} = 9$

So, Beth can cut 9 pieces of wire.

Use the reciprocal to write a multiplication problem. Solve the problem. Write the answer in simplest form.

1. $3 \div \frac{1}{8}$ 　　2. $5 \div \frac{1}{2}$ 　　3. $10 \div \frac{2}{3}$ 　　4. $27 \div \frac{3}{5}$

$\frac{3}{1} \times \frac{8}{1} = 24$ _____ _____ _____

5. $12 \div \frac{4}{5}$ 　　6. $8 \div \frac{3}{4}$ 　　7. $18 \div \frac{3}{8}$ 　　8. $7 \div \frac{4}{5}$

_____ _____ _____ _____

9. $6 \div \frac{3}{4}$ 　　10. $16 \div \frac{4}{5}$ 　　11. $9 \div \frac{6}{7}$ 　　12. $2 \div \frac{3}{10}$

_____ _____ _____ _____

13. $9 \div \frac{3}{8}$ 　　14. $9 \div \frac{1}{5}$ 　　15. $6 \div \frac{3}{20}$ 　　16. $20 \div \frac{4}{5}$

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