2.2 DIVIDING FRACTIONS

ESSENTIAL QUESTION:

How do you divide fractions?

$\frac{2}{5} \cdot \frac{5}{2} = \frac{10}{10} = 1$ $\frac{2}{5}$ and $\frac{5}{2}$ are reciprocals

Two numbers whose product is 1 are reciprocals.

To write the reciprocal of a number write the number as a fraction. Then invert the fraction.

Write the reciprocal of 4. $\frac{1}{4}$

EXAMPLE 1

Write the reciprocal of the number.

1) $\frac{3}{5}$ $\frac{5}{3}$ 2) $\frac{9}{5}$ $\frac{5}{9}$ 2) 2 $\frac{1}{2}$

ON YOUR OWN

1) $\frac{3}{4}$ $\frac{4}{3}$ 2) 5 $\frac{1}{5}$ 3) $\frac{7}{2}$ $\frac{2}{7}$

Keep the first fraction.

Change division to multiplication

Flip the second fraction.

EXAMPLE 2

Divide. Write answer in simplest form.

1) $\frac{1}{6} \div \frac{2}{3}$ $\frac{1}{6} \cdot \frac{3}{2} = \frac{1}{4}$ 2) $\frac{2}{7} \div \frac{1}{3}$ $\frac{2}{7} \cdot \frac{3}{1} = \frac{6}{7}$ 3) $\frac{1}{2} \div \frac{1}{8}$ $\frac{1}{2} \cdot \frac{8}{1} = 4$ 4) $\frac{2}{5} \div \frac{3}{10}$ $\frac{2}{5} \cdot \frac{10}{3} = \frac{4}{3}$

EXAMPLE 3

Divide. Write answer in simplest form.

1) $\frac{4}{5} \div 2$ $\frac{4}{5} \cdot \frac{1}{2} = \frac{2}{5}$ 2) $\frac{1}{2} \div 3$ $\frac{1}{2} \cdot \frac{1}{3} = \frac{1}{6}$ 3) $\frac{2}{3} \div 10$ $\frac{1}{3} \cdot \frac{1}{10} = \frac{1}{15}$ 4) $\frac{5}{8} \div 4$ $\frac{5}{8} \cdot \frac{1}{4} = \frac{5}{32}$ 5) $\frac{6}{7} \div 4$ $\frac{3}{7} \cdot \frac{1}{2} = \frac{3}{14}$

EXAMPLE 4

A piece of wood is 3 feet long. How many $\frac{3}{4}$ foot pieces can you cut from the piece of wood?

$\frac{3}{1} \div \frac{3}{4}$

$\frac{12}{1} \cdot \frac{4}{3} = 4$

You can cut 4 $\frac{3}{4}$ feet pieces from the piece of wood.

EXAMPLE 5

Evaluate the expression.

1) $\frac{4}{5} + \frac{2}{5} \div \frac{4}{1}$

$\frac{4}{5} + \frac{2}{5} \cdot \frac{1}{4}$

$\frac{4}{5} + \frac{1}{10}$

$\frac{8}{10} + \frac{1}{10} = \frac{9}{10}$

2) $\frac{3}{8} + \frac{5}{6} \div \frac{5}{1}$

$\frac{3}{8} + \frac{5}{6} \cdot \frac{1}{5}$

$\frac{3}{8} + \frac{1}{6}$

$\frac{9}{24} + \frac{4}{24} = \frac{13}{24}$

3) $\frac{3}{8} \div \frac{3}{4} - \frac{1}{6}$

$\frac{2}{4} \cdot \frac{4}{3} - \frac{1}{6}$

$\frac{2}{3} - \frac{1}{6}$

$\frac{3}{6} - \frac{1}{6} = \frac{2}{6} = \frac{1}{3}$

4) $\frac{8}{9} \div 2 \div 8$

$\frac{8}{9} \cdot \frac{1}{2} \cdot \frac{8}{1}$

$\frac{4}{9} \cdot \frac{8}{1}$

$\frac{4}{9} \cdot \frac{1}{8} = \frac{1}{18}$