Name: _____ Date: _____

CH 6 Multiplying a Whole Number by a Fraction

GOAL

Use repeated addition to multiply fractions by whole numbers.

1. **a)** Write $4 \times \frac{3}{5}$ as a repeated addition sentence.

_____ + _____ + _____ + _____ = _____

2. Multiply. Write your answer as a fraction and as a mixed number.

a) $7 \times \frac{2}{5} =$ _____ _____

b) $4 \times \frac{3}{8} =$ _____ _____

3. How much farther are 3 jumps of $\frac{2}{5}$ on a number line than 2 jumps of $\frac{3}{5}$? Explain.

_____

4. Math class is $\frac{4}{6}$ h for three days of each school week. How many hours of math class does a student have in one week?

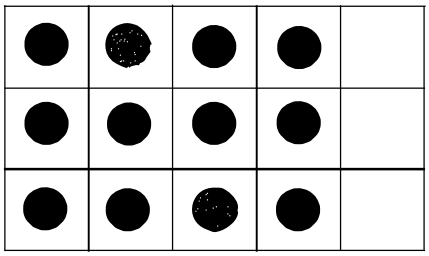
_____ × _____ = _____

At-Home Help

To multiply a whole number by a fraction, you can:

Multiply using grids and counters.

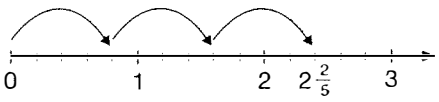
$3 \times \frac{4}{5}$ means the same as 3 sets of $\frac{4}{5}$.



Each square represents $\frac{1}{5}$, so the 12 squares covered with counters represent $\frac{12}{5}$.

Multiply using a number line.

Calculate $3 \times \frac{4}{5}$ using a number line. Write the product both as an improper fraction and as a whole or mixed number.



$3 \times \frac{4}{5} = 3 \times 4$ fifths

$= 12$ fifths

$= \frac{12}{5}$ or $2\frac{2}{5}$

Name: _____ Date: _____

CH 6 Exploring Calculating a Fraction of a Fraction

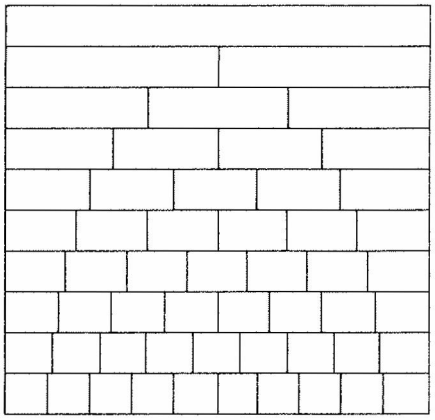
GOAL

Represent one fraction as part of another fraction.

1. Draw a picture to show $\frac{1}{3}$ of $\frac{1}{4}$.

At-Home Help

This fraction strip tower shows the relationship between fractions as parts of a whole.



2. Determine the missing fraction. Use the fraction strip tower to help you.

   a) $\frac{1}{3}$ of $\frac{1}{2}$ is $\square$

   b) $\frac{3}{4}$ of $\frac{1}{2}$ is $\square$

   d) $\frac{2}{3}$ of $\frac{1}{4}$ is $\square$

Name: _____ Date: _____

CH 6 Multiplying Fractions

GOAL

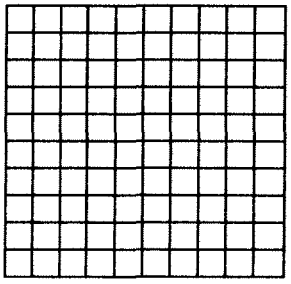
Multiply two fractions less than 1.

1. Draw a model to determine the product of $\frac{4}{5} \times \frac{1}{2}$.

2. Match each expression with its product in the box to the right.

a)	$\frac{3}{4} \times \frac{2}{5}$	**i)**	$\frac{2}{5}$
b)	$\frac{3}{5} \times \frac{2}{3}$	**ii)**	$\frac{1}{15}$
c)	$\frac{1}{6} \times \frac{2}{5}$	**iii)**	$\frac{3}{10}$
d)	$\frac{3}{8} \times \frac{4}{9}$	**iv)**	$\frac{1}{6}$

3. **a)** Shade the grid to show why $\frac{2}{3} \times \frac{5}{8} = \frac{10}{24}$.



At-Home Help

To multiply $\frac{2}{3} \times \frac{3}{5}$, you can:

Use a fraction strip model.

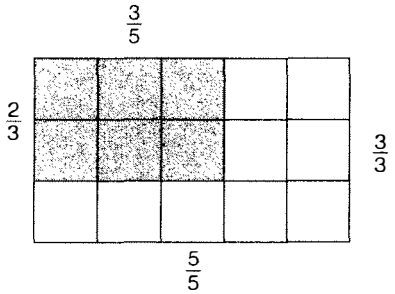
Model $\frac{3}{5}$ and divide each fifth into thirds.

Then, to show $\frac{2}{3}$ of each section, colour 2 of the thirds.

$\frac{2}{3} \times \frac{3}{5} = \frac{6}{15}$

Use a grid model.

Calculate the area of a rectangle $\frac{2}{5}$ of a unit wide and $\frac{2}{3}$ of a unit long.



The coloured rectangle has $2 \times 3 = 6$ squares, so its area is $\frac{6}{15}$ square units.

$\frac{2}{3} \times \frac{3}{5} = \frac{6}{15}$

Multiply.

You can multiply the numerators and the denominators. For example,

$\frac{2}{3} \times \frac{3}{5} = \frac{2 \times 3}{3 \times 5}$ or $\frac{6}{15}$

Name: _____ Date: _____

CH 6 Exploring Estimating Fraction Products

GOAL

Solve the following fraction multiplication questions

At-Home Help

Top x Top
Bottom x Bottom

Change to mixed number and reduce when necessary

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

a) $\frac{5}{3} \times \frac{4}{5}$

b) $\frac{6}{7} \times \frac{9}{10}$

c) $\frac{2}{3} \times \frac{4}{5}$

d) $\frac{4}{9} \times \frac{7}{13}$

2.

a) $\frac{1}{9} \times \frac{1}{2}$

b) $\frac{1}{1000} \times \frac{1}{100}$

c) $\frac{10}{20} \times \frac{7}{14}$

d) $\frac{5}{7} \times \frac{8}{9}$

a) $\frac{5}{11} \times \frac{7}{15}$ b) $\frac{8}{9} \times \frac{7}{8}$ c) $\frac{4}{9} \times \frac{3}{7}$ d) $\frac{2}{3} \times \frac{3}{6}$

Name: _____ Date: _____

CH 6 Multiplying Fractions Greater than 1

GOAL

Multiply mixed numbers and improper fractions.

1. ~~Estimate~~ Solve each product.

   a) $1\frac{1}{3} \times 1\frac{2}{3}$

   b) $3\frac{1}{5} \times 6\frac{3}{8}$

2. Multiply the following

   a) $1\frac{1}{2} \times 1\frac{1}{3} =$ ____

   b) $3\frac{1}{5} \times 2\frac{1}{4} =$ ____

3. Multiply using improper fractions.

   a) $2\frac{1}{5} \times 3\frac{1}{6} =$ ____ × ____ or ____

   b) $2\frac{1}{4} \times 3\frac{1}{3} =$ ____ × ____ or ____

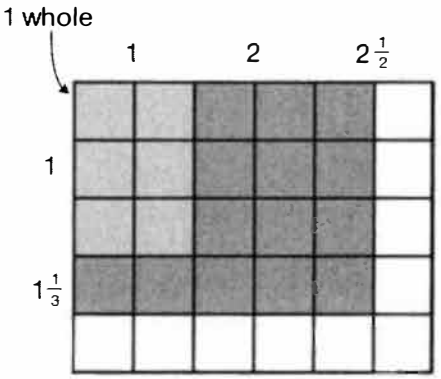
= =

____ ____ ____

At-Home Help

To multiply mixed fractions, you can:

Use an area model.
For example, to calculate the area of a rectangle $1\frac{1}{3}$ units long and $2\frac{1}{2}$ units wide:



$1\frac{1}{3} \times 2\frac{1}{2} = \frac{20}{6}$ or $\frac{4}{3} \times \frac{5}{2} = \frac{20}{6}$

There are 6 squares in a whole, so each square is $\frac{1}{6}$. There are 20 squares in the coloured rectangle.

Another way to record this is $1 + 1 + \frac{8}{6} = 2\frac{8}{6}$, or $3\frac{2}{6}$, or $3\frac{1}{3}$

There are two wholes and 8 other squares in the coloured rectangle.

Multiply improper fractions.
Write each mixed number as an improper fraction and multiply as you would with proper fractions.

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

$= \frac{4 \times 5}{3 \times 2}$

$= \frac{20}{6}$

Name: _____ Date: _____

CH 6 Dividing Fractions by Whole Numbers

GOAL

Solve these division questions

1. $\frac{6}{9} \div 4 =$

2. a) $\frac{2}{3} \div 5$

3. Divide.

a) $\frac{5}{3} \div 10 =$ ____

$=$ ____

b) $\frac{2}{7} \div 4 =$ ____

$=$ ____

4. $\frac{4}{5}$ of a room has to be painted. 3 painters are going to share the job. What fraction of the room will each painter complete if they all paint at the same rate?

At-Home Help

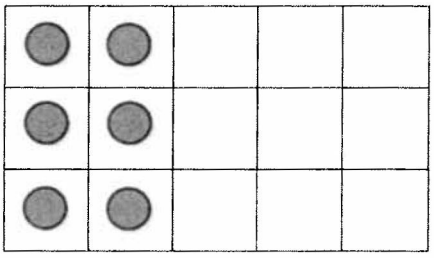
To divide a fraction by a whole number, you can:

Think of it as sharing.

For example, $\frac{2}{5} \div 3$ tells you the share size if 3 people share $\frac{2}{5}$ of something.

You cannot share $\frac{2}{5}$ equally among three people, so write an equivalent fraction.

$\frac{2}{5} = \frac{6}{15}$



$\frac{3}{15}$ are in each group, so $\frac{2}{5} \div 3 = \frac{2}{15}$.

Multiply by a fraction.

For example, $\frac{2}{5} \div 3$ is the same as $\frac{1}{3}$ of $\frac{2}{5}$, or $\frac{1}{3} \times \frac{2}{5} = \frac{2}{15}$.

Divide using an equivalent fraction, where the numerator is a multiple of the whole number.

For example, $\frac{2}{5} \div 3 = \frac{6}{15} \div 3$

$= \frac{2}{15}$

Name: _____ Date: _____

CH 6 Estimating Fraction Quotients

GOAL

Solve these division questions

1. Estimate the quotient as a whole number.

a) $\frac{5}{10} \div \frac{3}{8}$

b) $\frac{3}{7} \div \frac{5}{9}$

2. Solve

a) $\frac{8}{10} \div \frac{1}{4}$

b) $\frac{8}{3} \div \frac{1}{2}$

c) $\frac{3}{2} \div \frac{3}{7}$

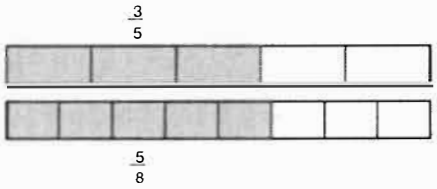
d) $\frac{1}{2} \div \frac{2}{3}$

At-Home Help

To estimate a quotient of fractions less than 1, you can:

Compare fractions by multiplying.

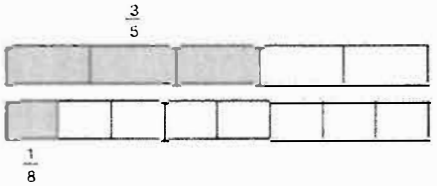
For example, estimate $\frac{3}{5} \div \frac{1}{8}$.



$5 \times \frac{1}{8} = \frac{5}{8}$, which is close to $\frac{3}{5}$.
$\frac{3}{5} \div \frac{1}{8}$ is close to 5.

Use fraction strips to visualize the quotient.

For example, to see how $\frac{3}{5}$ relates to $\frac{1}{8}$, see how many times $\frac{1}{8}$ fits into $\frac{3}{5}$. It looks like it fits about 5 times.



Compare using equivalent fractions.

For example, $\frac{3}{5} = \frac{24}{40}$ and $\frac{1}{8} = \frac{5}{40}$.
24 is about 5 times greater than 5, so $\frac{3}{5} \div \frac{1}{8}$ is close to 5.

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CH 6 Dividing Fractions by Measuring

GOAL

Divide fractions using models and using equivalent fractions with a common denominator.

1. Calculate using common denominators.

a) $\frac{1}{4} \div \frac{7}{8} = \frac{\square}{\square} \div \frac{7}{8}$

$= \frac{\quad}{\quad}$

b) $\frac{3}{4} \div 2\frac{1}{2} = \frac{3}{4} \div \frac{\square}{\square}$

$= \frac{\quad}{\quad}$

2. Calculate each quotient using equivalent fractions.

a) $1\frac{1}{2} \div \frac{2}{3} = \frac{\square}{\square} \div \frac{\square}{\square}$

$= \frac{\square}{\square} \div \frac{\square}{\square}$

$= \frac{\quad}{\quad}$

b) $\frac{2}{3} \div 1\frac{1}{2} = \frac{\square}{\square} \div \frac{\square}{\square}$

$= \frac{\square}{\square} \div \frac{\square}{\square}$

$= \frac{\quad}{\quad}$

3. Sally has $3\frac{1}{2}$ L of apple juice in the fridge. Each glass holds $\frac{1}{3}$ L.

a) Set up a division statement to calculate how many glasses of apple juice Sally can pour.

_____ ÷ _____

b) Solve your statement. How many glasses of apple juice can Sally pour?

_____ ÷ _____ = _____ ÷ _____

= _____ ÷ _____

= _____

4. Does order matter when you divide fractions? Explain.

_____

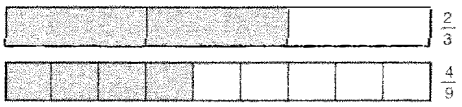
_____

At-Home Help

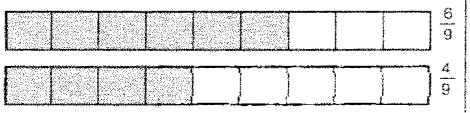
To divide two fractions, you can:

Determine the number of times the divisor fits into the dividend using fraction strips and a common denominator.

For example, to calculate $\frac{2}{3} \div \frac{4}{9}$:



Compare using equivalent fractions.



$\frac{2}{3} \div \frac{4}{9} = \frac{6}{9} \div \frac{4}{9}$

$= 6 \div 4$

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

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CH6 Dividing Fractions Using a Related Multiplication

GOAL

Divide fractions using a related multiplication.

1. Calculate.

   a) $\frac{2}{3} \div \frac{3}{4} =$ ____ × ____ or ____

   b) $\frac{4}{5} \div \frac{3}{5} =$ ____ × ____ or ____

   c) $\frac{5}{6} \div \frac{1}{3} =$ ____ × ____ or ____

   d) $\frac{7}{16} \div \frac{6}{20} =$ ____ × ____ or ____

At-Home Help

To divide two fractions, you can:

Multiply by the reciprocal.
The reciprocal is the fraction that results from switching the numerator and denominator. For example, $\frac{4}{5}$ is the reciprocal of $\frac{5}{4}$.
Calculate using the reciprocal.

$\frac{2}{3} \div \frac{4}{9} = \frac{2}{3} \times \frac{9}{4}$
$= \frac{18}{12}$
$= 1\frac{6}{12}$ or $1\frac{1}{2}$

2. Write =, <, or > in each box. Calculate the quotients that are greater than 2.

   a) $\frac{6}{10} \div \frac{1}{4} \square 2$; $\frac{6}{10} \div \frac{1}{4} =$ ____

   b) $\frac{1}{3} \div \frac{2}{1} \square 2$; $\frac{1}{3} \div \frac{2}{1} =$ ____

   c) $\frac{7}{8} \div \frac{2}{5} \square 2$; $\frac{7}{8} \div \frac{2}{5} =$ ____

   d) $\frac{2}{3} \div \frac{1}{2} \square 2$; $\frac{2}{3} \div \frac{1}{2} =$ ____

3. Why does it make sense that $\frac{6}{7} \div \frac{2}{3}$ is greater than $\frac{6}{7}$?

   _____

4. Jack delivers newspapers as his part-time job. It takes $5\frac{1}{2}$ min to deliver one newspaper.

   a) How many newspapers can Jack deliver in 20 min? ____ $\div 5\frac{1}{2} =$ _____

   b) How many newspapers can Jack deliver in 45 min? ____ $\div 5\frac{1}{2} =$ _____

   c) How many newspapers can Jack deliver in $1\frac{1}{2}$ h? ____ $\div 5\frac{1}{2} =$ _____

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CH 6 Order of Operations

GOAL

Use the order of operations in calculations involving fractions.

1. Calculate using the rules for order of operations.

a) $\left(\frac{1}{2}+\frac{1}{3}\right)\times\frac{6}{7}=$

b) $\frac{3}{4}\div\left(\frac{1}{2}+\frac{1}{4}\right)=$

c) $\frac{4}{6}\div\left(\frac{5}{7}\div\frac{1}{2}\right)+\frac{2}{4}=$

d) $\frac{4}{6}\div\left(\frac{5}{7}\times\frac{1}{2}+\frac{2}{4}\right)=$

e) $\left(\frac{5}{10}-\frac{1}{3}\times\frac{2}{8}+\frac{1}{5}\right)\div\frac{1}{6}=$

At-Home Help

The order of operations is:

- Perform the operations in the brackets first.
- Divide and multiply from left to right.
- Add and subtract from left to right.
- Write the answer as a mixed number.

For example:

$\frac{3}{2}-\frac{2}{5}\div\frac{1}{5}\times\frac{3}{10}+\frac{2}{3}$ Divide.

$=\frac{3}{2}-2\times\frac{3}{10}+\frac{2}{3}$ Multiply.

$=\frac{3}{2}-\frac{6}{10}+\frac{2}{3}$ Subtract.

$=\frac{15}{10}-\frac{6}{10}+\frac{2}{3}$

$=\frac{9}{10}+\frac{2}{3}$ Add.

$=\frac{27}{30}+\frac{20}{30}$

$=\frac{47}{30}$ or $1\frac{17}{30}$

2. Place brackets to make this equation true.

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