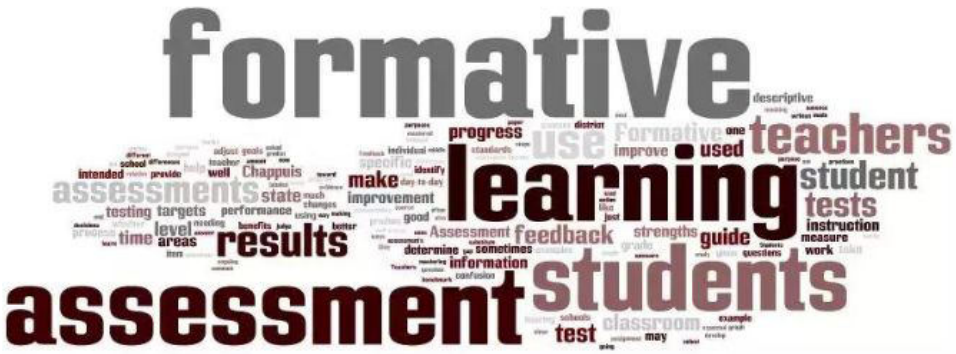
EUREKA MATH PUSD

Solutions



Exit Tickets

Solutions

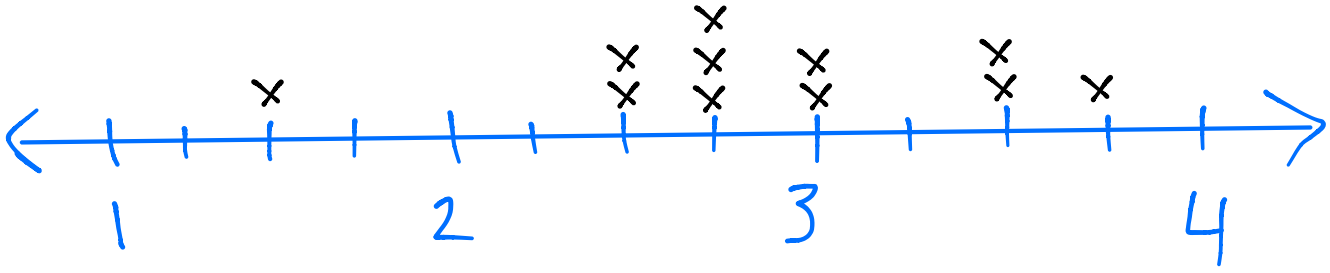
GRADE 5
MODULE 4

Version 3

Name _____ Date _____

1. Draw a line plot for the following data measured in inches:

$1\frac{1}{2}, 2\frac{3}{4}, 3, 2\frac{3}{4}, 2\frac{1}{2}, 2\frac{3}{4}, 3\frac{3}{4}, 3, 3\frac{1}{2}, 2\frac{1}{2}, 3\frac{1}{2}$



2. Explain how you decided to divide your wholes into fractional parts and how you decided where your number scale should begin and end.

Answers will vary.

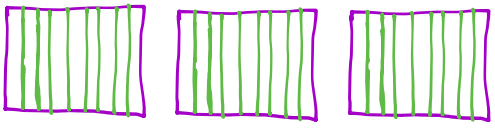
I cut each whole into fourths because the fractions with the largest denominators were fourths.

I started at 1 and ended at 4 because that would create an interval that would include all the measurements.

Name _____ Date _____

1. Draw a picture that shows the division expression. Then, write an equation and solve.

a. $3 \div 9$

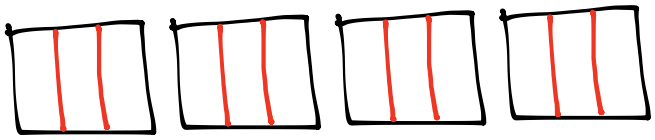


$3 \div 9 = 27 \text{ ninths} \div 9$

$= 3 \text{ ninths}$

$= \frac{3}{9}$

b. $4 \div 3$



$4 \div 3 = 12 \text{ thirds} \div 3 = 4 \text{ thirds} = \frac{4}{3}$

2. Fill in the blanks to make true number sentences.

a. $21 \div 8 = \frac{21}{8}$

b. $\frac{7}{4} = 7 \div 4$

c. $4 \div 9 = \frac{4}{9}$

d. $1\frac{2}{7} = 9 \div 7$

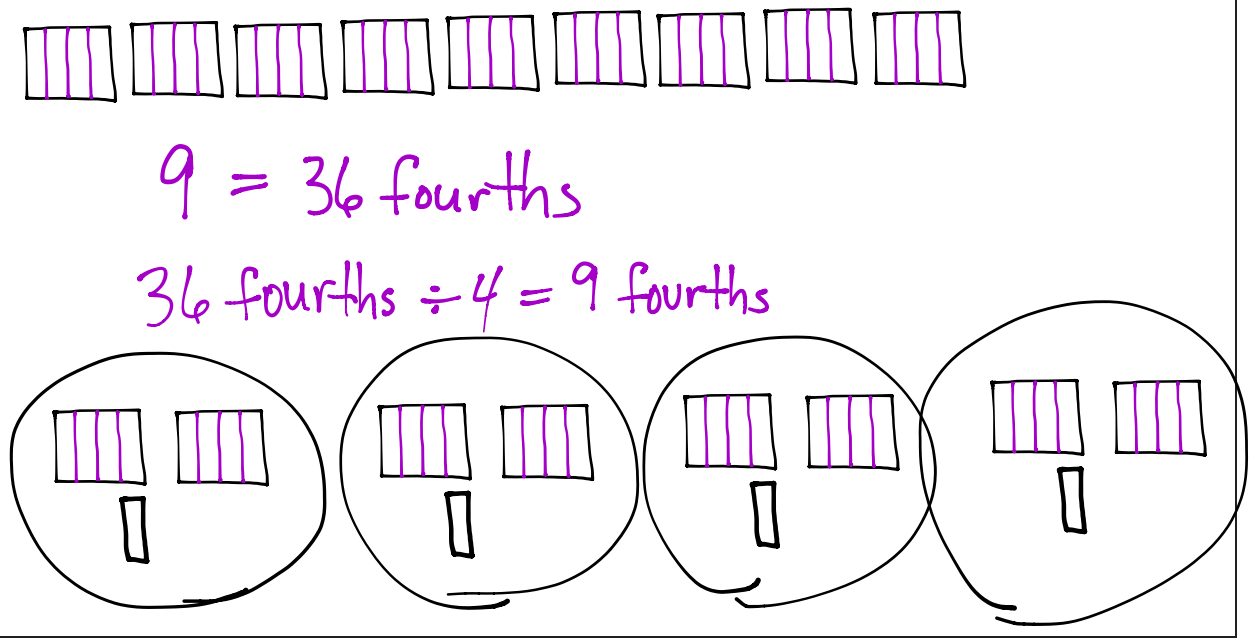
Name _____ Date _____

A baker made 9 cupcakes, each a different type. Four people want to share them equally. How many cupcakes will each person get?

Fill in the chart to show how to solve the problem.

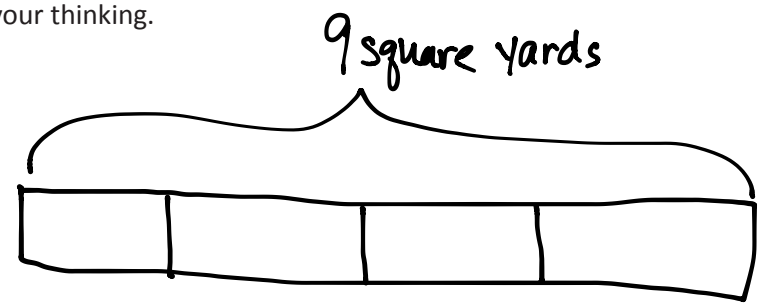
Division Expression	Unit Forms	Fractions and Mixed numbers	Standard Algorithm
$9 \div 4$	36 fourths ÷ 4 = 9 fourths	$\frac{9}{4} = 2\frac{1}{4}$	$4\overline{)9}$ → $2\frac{1}{4}$, -8, 1

Draw to show your thinking:



Name _____ Date _____

Matthew and his 3 siblings are weeding a flower bed with an area of 9 square yards. If they share the job equally, how many square yards of the flower bed will each child need to weed? Use a tape diagram to show your thinking.



4 units = 9 square yards

1 unit = $9 \div 4 = 2\frac{1}{4}$ square yards

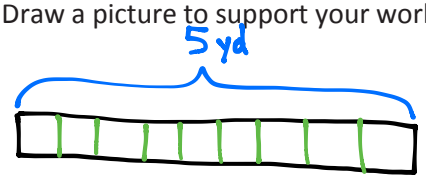
$$\begin{array}{r} 2\frac{1}{4} \\ 4\overline{)\,9} \\ -\,8 \\ \hline 1 \end{array}$$

Each child weeds $2\frac{1}{4}$ square yards.

Name _____ Date _____

A grasshopper covered a distance of 5 yards in 9 equal hops. How many yards did the grasshopper travel on each hop?

a. Draw a picture to support your work.



9 units = 5 yd
1 unit = 5 ÷ 9
1 unit = $\frac{5}{9}$ yd.

$$9\overline{)5} \quad 0\ \tfrac{5}{9} \quad -0 \quad 5$$

Each hop is $\frac{5}{9}$ yard.

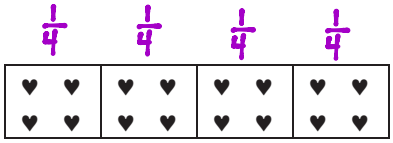
b. How many yards did the grasshopper travel after hopping twice?

Two hops = $\frac{5}{9} + \frac{5}{9} = \frac{10}{9} = 1\frac{1}{9}$

Two hops is $1\frac{1}{9}$ yards.

Name _____ Date _____

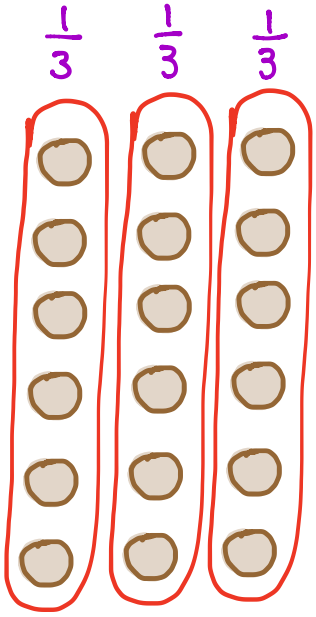
1. Find the value of each of the following.



a. $\frac{1}{4}$ of 16 = 4

b. $\frac{3}{4}$ of 16 = 12

2. Out of 18 cookies, $\frac{2}{3}$ are chocolate chip. How many of the cookies are chocolate chip?



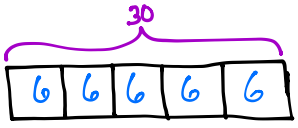
$\frac{2}{3}$ of 18 = 12

There are 12 chocolate chip cookies.

Name _____ Date _____

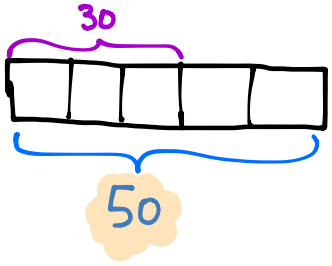
Solve using a tape diagram.

a. $\frac{3}{5}$ of 30 = 18



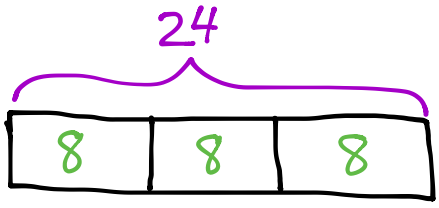
5 units = 30
1 unit = $\frac{30}{5}$ = 6
3 units = 3 × 6 = 18

b. $\frac{3}{5}$ of a number is 30. What's the number?



3 units = 30
1 unit = $\frac{30}{3}$ = 10
5 units = 5 × 10 = 50

c. Mrs. Johnson baked 2 dozen cookies. Two-thirds of the cookies were oatmeal. How many oatmeal cookies did Mrs. Johnson bake?



3 units = 24
1 unit = $\frac{24}{3}$ = 8
2 units = 2 × 8 = 16

Mrs. Johnson baked 16 oatmeal cookies.

Name _____ Date _____

Solve each problem in two different ways as modeled in the example.

Example: $\frac{2}{3} \times 6 = \frac{2 \times 6}{3} = \frac{12}{3} = 4$

$\frac{2}{3} \times 6 = \frac{2 \times \cancel{6}^{2}}{\cancel{3}_{1}} = 4$

a. $\frac{2}{3} \times 15 = \frac{2 \times 15}{3} = \frac{30}{3} = 10$

$\frac{2}{3} \times 15 = \frac{2 \times \cancel{15}^{5}}{\cancel{3}_{1}} = \frac{10}{1} = 10$

b. $\frac{5}{4} \times 12 = \frac{5 \times 12}{4} = \frac{60}{4} = 15$

$\frac{5}{4} \times 12 = \frac{5 \times \cancel{12}^{3}}{\cancel{4}_{1}} = \frac{15}{1} = 15$

Name _____ Date _____

1. Express 36 minutes as a fraction of an hour: 36 minutes = $\frac{36}{60}$ hour

NOTE: Question 1 was not taught in the Concept Development. Consider skipping this question.

2. Solve.

a. $\frac{2}{3}$ feet = 8 inches

$\frac{2}{3}$ feet = $\frac{2}{3} \times$ (1 foot)

$= \frac{2}{3} \times$ (12 inches)

$= \frac{24}{3}$ inches

$= 8$ inches

b. $\frac{2}{5}$ m = 40 cm

$\frac{2}{5}$ m = $\frac{2}{5} \times$ (1 m)

$= \frac{2}{5} \times$ (100 cm)

$= \frac{2 \times 100^{20}}{1 \cancel{5}}$ cm

$= 40$ cm

c. $\frac{5}{6}$ year = 10 months

$\frac{5}{6}$ year = $\frac{5}{6} \times$ (1 year)

$= \frac{5}{6} \times$ (12 months)

$= \frac{5 \times \cancel{12}^{2}}{1 \cancel{6}}$ months

$= 10$ months

Name _____ Date _____

1. Rewrite these expressions using words.

a. $\frac{3}{4} \times \left(2\frac{2}{5} - \frac{5}{6}\right)$

3 fourths of the difference between $2\frac{2}{5}$ and $\frac{5}{6}$.

b. $2\frac{1}{4} + \frac{8}{3}$

The sum of $2\frac{1}{4}$ and $\frac{8}{3}$.

2. Write an expression, and then solve.

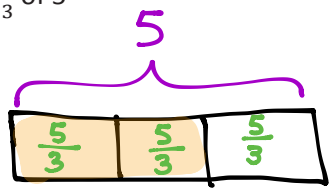
Three less than one-fourth of the product of eight thirds and nine

$\frac{1}{4} \times \left(\frac{8}{3} \times 9\right) - 3$

Name _____ Date _____

Use a tape diagram to solve.

$\frac{2}{3}$ of 5



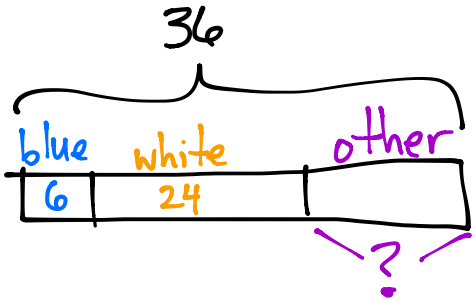
3 units = 5

1 unit = $\frac{5}{3}$

2 units = $2 \times \frac{5}{3} = \frac{2 \times 5}{3} = \frac{10}{3} = 3\frac{1}{3}$

Name _____ Date _____

In a classroom, $\frac{1}{6}$ of the students are wearing blue shirts, and $\frac{2}{3}$ are wearing white shirts. There are 36 students in the class. How many students are wearing a shirt other than blue or white?



$6+24=30$

$36-30=6$

6 students are wearing a shirt of a different color.

Blue Shirts

$\frac{1}{6}$ of 36

$= \frac{1}{6} \times 36$

$= \frac{1 \times 36}{6}$

$= \frac{36}{6}$

$= 6$ students

White Shirts

$\frac{2}{3}$ of 36

$= \frac{2}{3} \times 36$

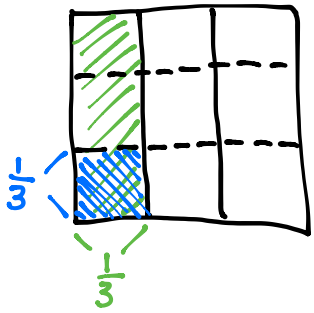
$= \frac{2 \times 36^{12}}{1 \quad 3}$

$= 24$ students

Name _____ Date _____

1. Solve. Draw a rectangular fraction model, and write a number sentence to show your thinking.

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

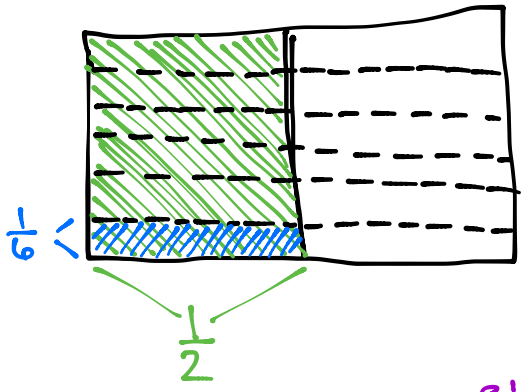


$\frac{1}{3}$ of $\frac{1}{3}$

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

$= \frac{1}{9}$

2. Ms. Sheppard cuts $\frac{1}{2}$ of a piece of construction paper. She uses $\frac{1}{6}$ of the piece to make a flower. What fraction of the sheet of paper does she use to make the flower?



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

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

$= \frac{1}{12}$

She uses $\frac{1}{12}$ of the sheet of paper.

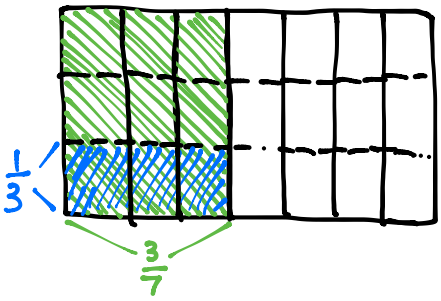
Name _____ Date _____

1. Solve. Draw a rectangular fraction model to explain your thinking. Then, write a number sentence.

$\frac{1}{3}$ of $\frac{3}{7}$ = $\frac{1}{3} \times \frac{3}{7}$

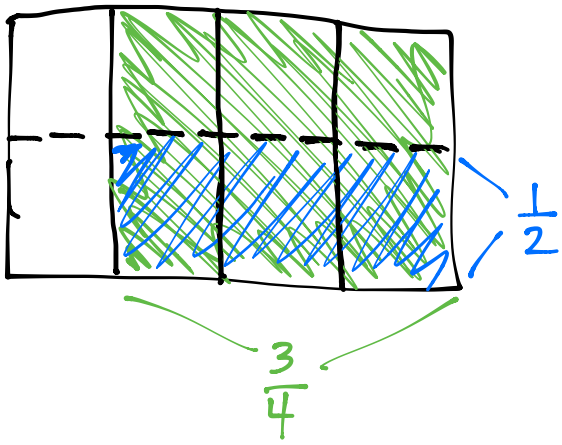
$= \frac{3}{21}$

$= \frac{1}{7}$



2. In a cookie jar, $\frac{1}{4}$ of the cookies are chocolate chip, and $\frac{1}{2}$ of the rest are peanut butter. What fraction of all the cookies is peanut butter?

$\frac{1}{2}$ of $\frac{3}{4} = \frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$

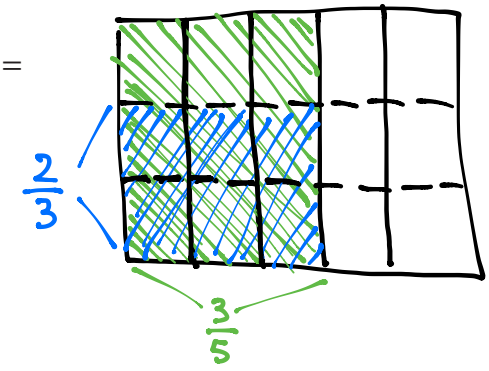


$\frac{3}{8}$ of the cookies are peanut butter.

Name _____ Date _____

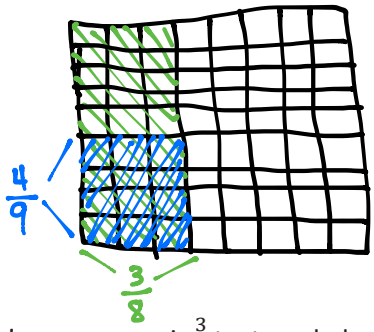
1. Solve. Draw a rectangular fraction model to explain your thinking. Then, write a multiplication sentence.

a. $\frac{2}{3}$ of $\frac{3}{5}$ =



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

b. $\frac{4}{9} \times \frac{3}{8}$ =



$\frac{4}{9} \times \frac{3}{8} = \frac{4 \times 3}{9 \times 8} = \frac{12}{72} = \frac{1}{6}$

-OR-

$\frac{4}{9} \times \frac{3}{8} = \frac{4 \times 3}{3 \times 8} = \frac{1}{6}$

2. A newspaper's cover page is $\frac{3}{8}$ text, and photographs fill the rest. If $\frac{2}{5}$ of the text is an article about endangered species, what fraction of the cover page is the article about endangered species?

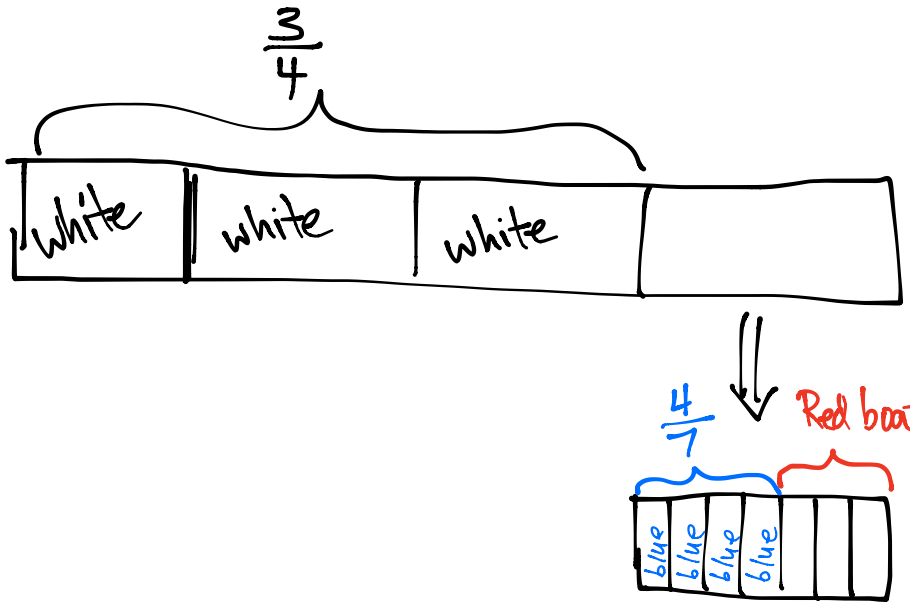
$\frac{2}{5}$ of $\frac{3}{8} = \frac{2}{5} \times \frac{3}{8} = \frac{2 \times 3}{5 \times 8} = \frac{3}{20}$

$\frac{3}{20}$ of the page is about endangered species.

Name _____ Date _____

Solve and show your thinking with a tape diagram.

Three-quarters of the boats in the marina are white, $\frac{4}{7}$ of the remaining boats are blue, and the rest are red. If there are 9 red boats, how many boats are in the marina?



3 little units = 9

1 little unit = 3

7 little units = 21

1 big unit = 21

4 big units = 84

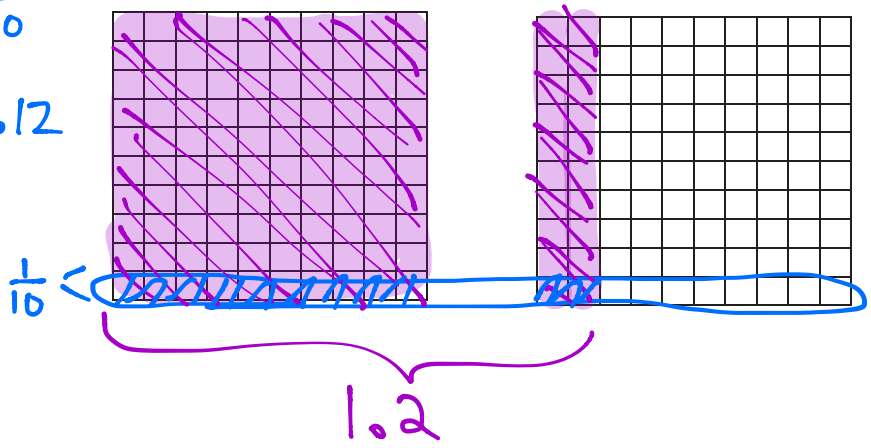
There are 84 boats in the marina.

Name _____ Date _____

1. Multiply and model. Rewrite the expression as a number sentence with decimal factors.

$\frac{1}{10} \times 1.2 = \frac{12}{100}$

$0.1 \times 1.2 = 0.12$



2. Multiply.

a. $1.5 \times 3 = 4.5$

$\frac{15}{10} \times 3 = \frac{15 \times 3}{10}$

$= \frac{45}{10}$

$= 4.5$

b. $1.5 \times 0.3 = 0.45$

$\frac{15}{10} \times \frac{3}{10} = \frac{45}{100}$

$= 0.45$

c. $0.15 \times 0.3 = 0.045$

$\frac{15}{100} \times \frac{3}{10} = \frac{45}{1000}$

$= 0.045$

Name _____ Date _____

Multiply. Do at least one problem using unit form and at least one problem using fraction form.

a. $3.2 \times 1.4 =$ 4.48

32 tenths
× 14 tenths
128
+320
448 hundredths

b. $1.6 \times 0.7 =$ 1.12

$= \frac{16}{10} \times \frac{7}{10} = \frac{112}{100} = 1\frac{12}{100} = 1.12$

c. $2.02 \times 4.2 =$ 8.484

$\frac{202}{100} \times \frac{42}{10} = \frac{8484}{1000}$

$= 8\frac{484}{1000}$

$= 8.484$

202
× 42
404
8080
8484

d. $2.2 \times 0.42 =$ 0.924

$= \frac{22}{10} \times \frac{42}{100} = \frac{924}{1000} = 0.924$

42
×22
84
+840
924

Name _____ Date _____

Convert. Express your answer as a mixed number, if possible.

a. 5 in = $\frac{5}{12}$ ft

$5 \text{ in} = 5 \times (1 \text{ in})$
$= 5 \times (\frac{1}{12} \text{ ft})$
$= \frac{5}{12} \text{ ft}$

b. 13 in = $1\frac{1}{12}$ ft

$13 \text{ in} = 13 \times (1 \text{ in})$
$= 13 \times (\frac{1}{12} \text{ ft})$
$= \frac{13}{12} \text{ ft}$
$= 1\frac{1}{12} \text{ ft}$

c. 9 oz = $\frac{9}{16}$ lb

$9 \text{ oz} = 9 \times (1 \text{ oz})$
$= 9 \times \frac{1}{16} \text{ lb}$
$= \frac{9}{16} \text{ lb}$

d. 18 oz = $1\frac{2}{16}$ lb

$18 \text{ oz} = 18 \times (1 \text{ oz})$
$= 18 \times \frac{1}{16} \text{ lb}$
$= \frac{18}{16} \text{ lb}$
$= 1\frac{2}{16} \text{ lb}$ or $1\frac{1}{8} \text{ lb}$

Name _____ Date _____

Convert. Express your answer as a mixed number.

a. $2\frac{1}{6}$ ft = 26 in

$2\frac{1}{6}$ ft $= 2\frac{1}{6} \times (1$ ft$)$

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

$= \frac{13}{6} \times 12$ in

$= \frac{13 \times 12^{2}}{1 \cancel{6}} = 26$ in

b. $3\frac{3}{4}$ ft = $1\frac{1}{4}$ yd

$3\frac{3}{4}$ ft $= 3\frac{3}{4} \times (1$ ft$)$

$= 3\frac{3}{4} \times \frac{1}{3}$ yd

$= \frac{15}{4} \times \frac{1}{3}$ yd

$= \frac{5 \cancel{15} \times 1}{4 \times \cancel{3}_{1}}$ yd $= \frac{5}{4}$ yd $= 1\frac{1}{4}$ yd

c. $2\frac{1}{2}$ c = $1\frac{1}{4}$ pt

$2\frac{1}{2}$ c $= 2\frac{1}{2} \times (1$ c$)$

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

$= \frac{5}{2} \times \frac{1}{2}$ p

$= \frac{5 \times 1}{2 \times 2}$ p

$= \frac{5}{4}$ p

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

d. $3\frac{2}{3}$ years = 44 months

$3\frac{2}{3}$ years $= 3\frac{2}{3} \times (1$ year$)$

$= 3\frac{2}{3} \times (12$ months$)$

$= \frac{11}{3} \times 12$ months

$= \frac{11 \times \cancel{12}^{4}}{\cancel{3}_{1}}$ months

$= 44$ months

Name _____ Date _____

1. Fill in the blanks to make the equation true.

$\frac{9}{4} \times 1 = \frac{9}{4} \times \frac{5}{5} = \frac{45}{20}$

2. Express the fractions as equivalent decimals.

a. $\frac{1}{4} = \frac{1}{4} \times \frac{25}{25} = \frac{25}{100}$

$= 0.25$

b. $\frac{2}{5} = \frac{2}{5} \times \frac{2}{2} = \frac{4}{10}$

$= 0.4$

c. $\frac{3}{25} = \frac{3}{25} \times \frac{4}{4} = \frac{12}{100}$

$= 0.12$

d. $\frac{5}{20} = \frac{5}{20} \times \frac{5}{5} = \frac{25}{100}$

$= 0.25$

Name _____ Date _____

Fill in the blank to make the number sentences true. Explain how you know.

a. $\frac{4}{3} \times 11 > 11$ (Any number larger than 3.)

b. $5 \times \frac{7}{8} < 5$ (Any number less than 8.)

c. $6 \times \frac{2}{2} = 6$ (2 is the only number that works.)

Name _____ Date _____

1. Fill in the blank using one of the following scaling factors to make each number sentence true.

1.009	1.00	0.898

a. $3.06 \times$ 0.898 < 3.06

b. $5.2 \times$ 1.00 $= 5.2$

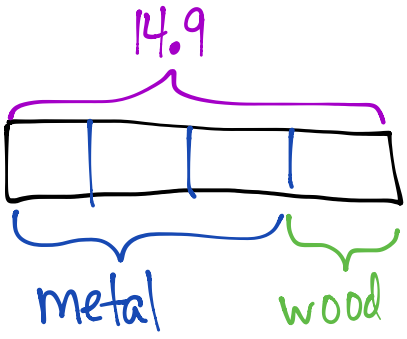
c. 1.009 $\times 0.89 > 0.89$

2. Will the product of 22.65×0.999 be greater than or less than 22.65? Without calculating, explain how you know.

The product will be less than 22.65, since 0.999 is less than one whole.

Name _____ Date _____

1. An artist builds a sculpture out of metal and wood that weighs 14.9 kilograms. $\frac{3}{4}$ of this weight is metal, and the rest is wood. How much does the wood part of the sculpture weigh?



Metal

$\frac{3}{4}$ of 14.9

4 units = 14.9

1 unit = $\frac{14.9}{4}$ = 3.725

3 units = 3 × 3.725

= 11.175

Wood

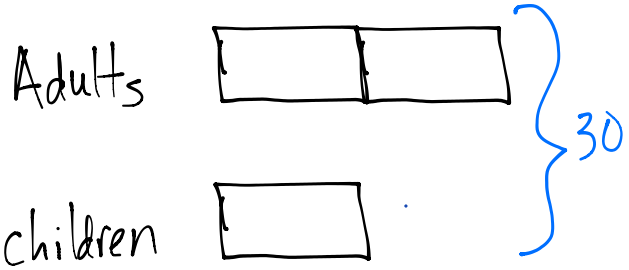
14.900

−11.175

3.725

The wood part weighs 3.725 kilograms.

2. On a boat tour, there are half as many children as there are adults. There are 30 people on the tour. How many children are there?



3 units = 30

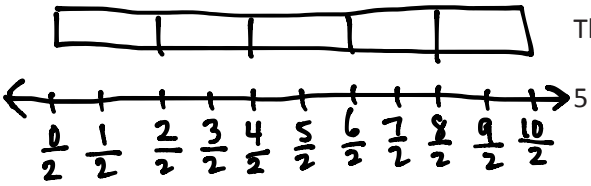
1 unit = 10

There are 10 children on the tour.

Name _____ Date _____

1. Draw a tape diagram and a number line to solve. Fill in the blanks that follow.

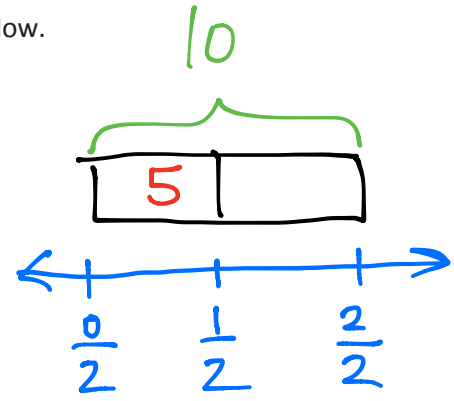
a. $5 \div \frac{1}{2} =$ 10



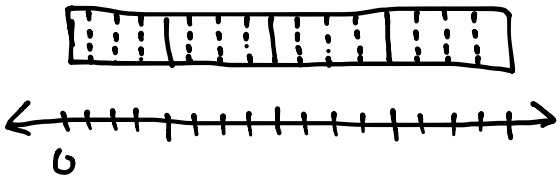
There are 2 halves in 1 whole.

There are 10 halves in 5 wholes.

5 is $\frac{1}{2}$ of what number? 10



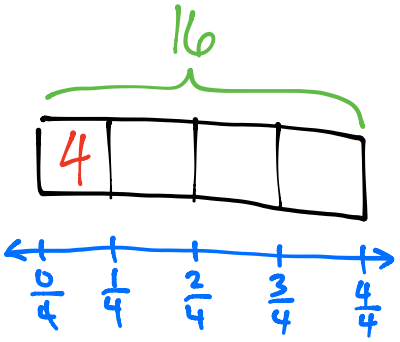
b. $4 \div \frac{1}{4} =$ 16



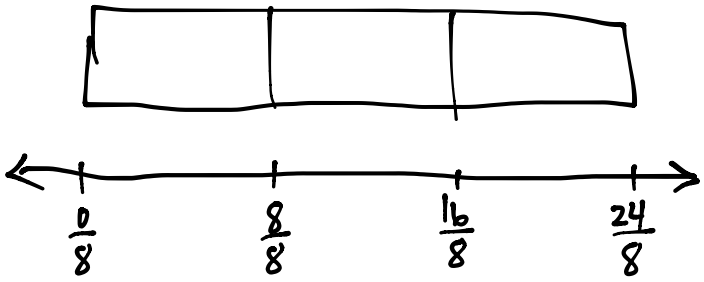
There are 4 fourths in 1 whole.

There are 16 fourths in 4 wholes.

4 is $\frac{1}{4}$ of what number? 16



2. Ms. Leverenz is doing an art project with her class. She has a 3 foot piece of ribbon. If she gives each student an eighth of a foot of ribbon, will she have enough for her class of 22 students?



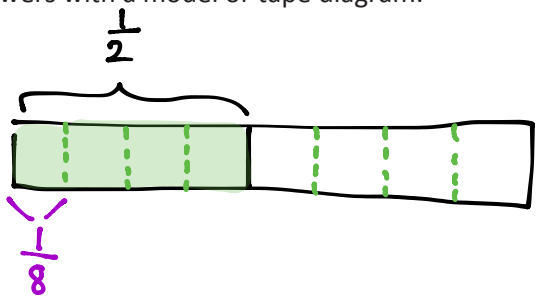
$3 \div \frac{1}{8} = 3 \times 8 = 24$

Yes, she will have enough for her class.

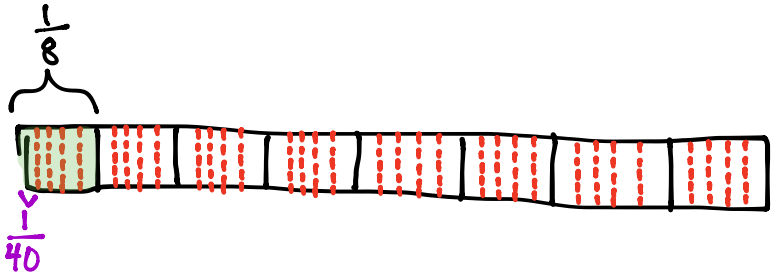
Name _____ Date _____

1. Solve. Support at least one of your answers with a model or tape diagram.

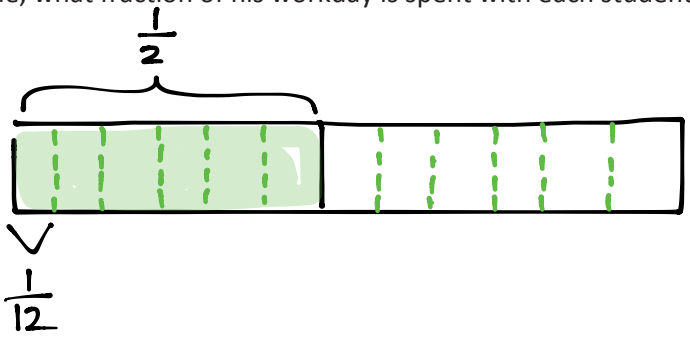
a. $\frac{1}{2} \div 4 =$ $\frac{1}{8}$



b. $\frac{1}{8} \div 5 =$ $\frac{1}{40}$



2. Larry spends half of his workday teaching piano lessons. If he sees 6 students, each for the same amount of time, what fraction of his workday is spent with each student?

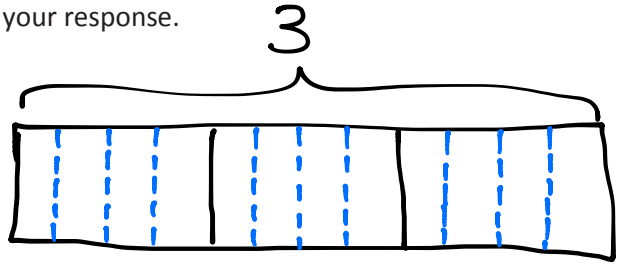


$\frac{1}{2} \div 6 = \frac{1}{12}$

He spends $\frac{1}{12}$ of his workday with each student.

Name _____ Date _____

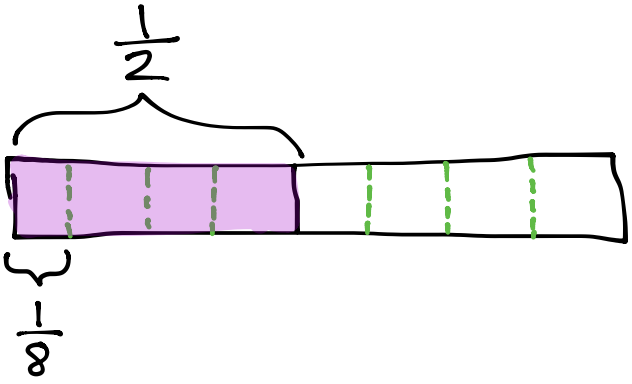
1. Kevin divides 3 pieces of paper into fourths. How many fourths does he have? Draw a picture to support your response.



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

He will have 12 fourths.

2. Sybil has $\frac{1}{2}$ of a pizza left over. She wants to share the pizza with 3 of her friends. What fraction of the original pizza will Sybil and her 3 friends each receive? Draw a picture to support your response.



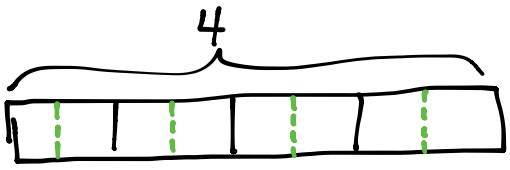
$\frac{1}{2} \div 4 = \frac{1}{8}$

Each person will have $\frac{1}{8}$ of the pizza.

Name STORY PROBLEMS WILL VARY Date _____

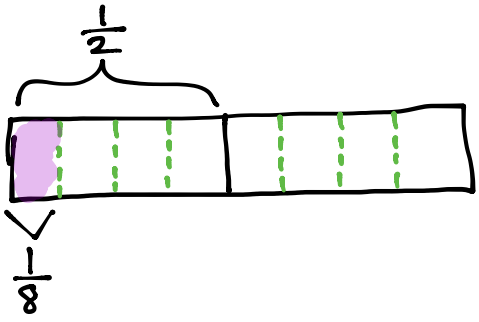
Create a word problem for the following expressions, and then solve.

a. $4 \div \frac{1}{2} = 8$



Jo has 4 feet of ribbon and needs to cut it into $\frac{1}{2}$ foot strips. How many lengths will she be able to make?

b. $\frac{1}{2} \div 4 = \frac{1}{8}$



Chris has a $\frac{1}{2}$ foot long piece of licorice rope. She shares it equally with her three friends. What fraction of a foot will each person get?

Name _____ Date _____

1. 8.3 is equal to

83 tenths

830 hundredths

2. 28 is equal to

2800 hundredths

280 tenths

3. $15.09 \div 0.01 =$ 1509

100 hundredths in 1.

1500 hundredths in 15.

9 hundredths in .09.

4. $267.4 \div \frac{1}{10} =$ 2674

10 tenths in 1

2670 tenths in 267

4 tenths in .4

5. $632.98 \div \frac{1}{100} =$ 63298

100 hundredths in 1.

63200 hundredths in 632

98 hundredths in .98

Name _____ Date _____

Rewrite the division expression as a fraction and divide.

a. 3.2 ÷ 0.8

$\frac{3.2}{0.8} \times \frac{10}{10} = \frac{32}{8} = 4$

b. 3.2 ÷ 0.08

$\frac{3.2}{0.08} \times \frac{100}{100} = \frac{320}{8} = 40$

c. 7.2 ÷ 0.9

$\frac{7.2}{0.9} \times \frac{10}{10} = \frac{72}{9} = 8$

d. 0.72 ÷ 0.09

$\frac{0.72}{0.09} \times \frac{100}{100} = \frac{72}{9} = 8$

Name _____ Date _____

Estimate first, and then solve using the standard algorithm. Show how you rename the divisor as a whole number.

1. $6.39 \div 0.09$ $\approx 630 \div 9 = 70$

$$\frac{6.39}{0.09} \times \frac{100}{100} = \frac{639}{9} = 71$$

$$\begin{array}{r} 71 \\ 9\overline{)639} \\ -63 \\ \hline 09 \\ -9 \\ \hline 0 \end{array}$$

2. $82.14 \div 0.6$ $\approx 840 \div 6 = 140$

$$\frac{82.14}{0.6} \times \frac{10}{10} = \frac{821.4}{6} = 136.9$$

$$\begin{array}{r} 136.9 \\ 6\overline{)821.4} \\ -6 \\ \hline 22 \\ -18 \\ \hline 41 \\ -36 \\ \hline 54 \\ -54 \\ \hline 0 \end{array}$$

Name _____ Date _____

1. Write an equivalent expression in numerical form.

   A fourth as much as the product of two-thirds and 0.8

   $\frac{1}{4} \times \left(\frac{2}{3} \times 0.8\right)$

2. Write an equivalent expression in word form.

   a. $\frac{3}{8} \times (1 - \frac{1}{3})$

   3 eighths of the difference of 1 and $\frac{1}{3}$.

   b. $(1 - \frac{1}{3}) \div 2$

   The difference of 1 and $\frac{1}{3}$ divided by 2.

3. Compare the expressions in 2(a) and 2(b). Without evaluating, determine which expression is greater, and explain how you know.

   2(b) is greater because $\div 2$ is equivalent to $\times \frac{1}{2}$. Since $\frac{1}{2}$ is bigger than $\frac{3}{8}$, 2(b) is bigger than 2(a).

Name _____ Date _____

An entire commercial break is 3.6 minutes.

a. If each commercial takes 0.6 minutes, how many commercials will be played?

$3.6 \div 0.6$

$\frac{3.6}{0.6} \times \frac{10}{10} = \frac{36}{6} = 6$

6 commercials will be played.

b. A different commercial break of the same length plays commercials half as long. How many commercials will play during this break?

$3.6 \div 0.3$

$\frac{3.6}{0.3} \times \frac{10}{10} = \frac{36}{3} = 12$

12 commercials will be played.