

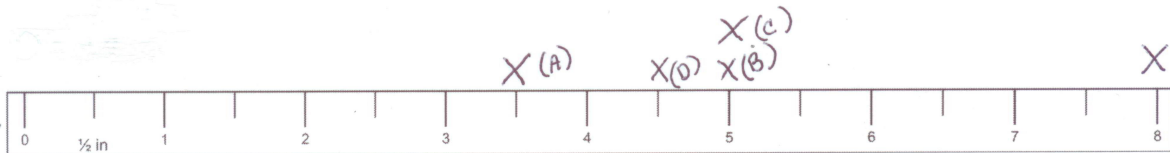
Your measurements will vary. These are examples only

Name _____ Date _____

1. Estimate the length of your pencil to the nearest inch. 7" Example estimate

Examples
Pencil
A = $3\frac{1}{2}$ "
B = 5"
C = 5"
D = $4\frac{1}{2}$ "

2. Using a ruler, measure your pencil strip to the nearest $\frac{1}{2}$ inch, and mark the measurement with an X above the ruler below. Construct a line plot of your classmates' pencil measurements. (measure a few pencils around the house) my pencil was almost 8" long

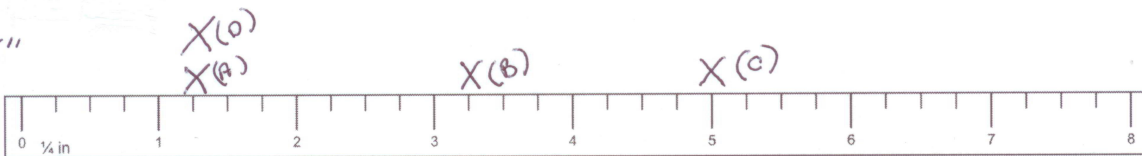


This is a line plot ↑ Place an X for each measurement

3. Using a ruler, measure your pencil strip to the nearest $\frac{1}{4}$ inch, and mark the measurement with an X above the ruler below. Construct a line plot of your classmates' pencil measurements.

Examples

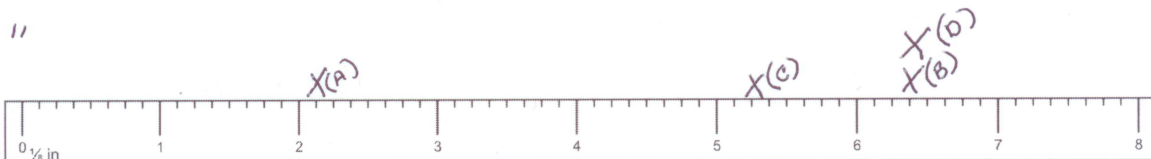
Pencil
A = $1\frac{1}{4}$ "
B = $3\frac{1}{4}$ "
C = 5"
D = $1\frac{1}{4}$ "



4. Using a ruler, measure your pencil strip to the nearest $\frac{1}{8}$ inch, and mark the measurement with an X above the ruler below. Construct a line plot of your classmates' pencil measurements.

Examples

Pencil
A = $2\frac{1}{8}$ "
B = $6\frac{3}{8}$ "
C = $5\frac{2}{8}$ "
D = $6\frac{3}{8}$ "



5. Use all three of your line plots to complete the following:
- Compare the three plots, and write one sentence that describes how the plots are alike and one sentence that describes how they are different.

Example

These three line plots are alike because each plot has two pencils that are the same length.

They are different because #3 has more short pencils and #4 has more long pencils.

- What is the difference between the measurements of the longest and shortest pencils on each of the three line plots?

From my

Example

$$\begin{array}{r} \#2 = 8'' = 7\frac{2}{2} \\ - 3\frac{1}{2} - 3\frac{1}{2} \\ \hline 4\frac{1}{2}'' \text{ difference} \end{array}$$

$$\begin{array}{r} \#3 = 5'' = 4\frac{4}{4} \\ - 1\frac{1}{4} - 1\frac{1}{4} \\ \hline 3\frac{3}{4}'' \text{ difference} \end{array}$$

$$\begin{array}{r} \#4 = 6\frac{3}{8}'' \\ - 2\frac{1}{8} \\ \hline 4\frac{2}{8}'' \text{ or } 4\frac{1}{4}'' \text{ difference} \end{array}$$

- Write a sentence describing how you could create a more precise ruler to measure your pencil strip.

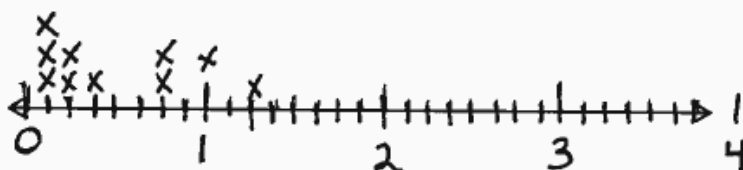
Example

A more precise ruler might be drawn larger and it would be broken down to smaller partitions like $\frac{1}{16}$ of an inch, or you could use millimeters.

Name _____

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A meteorologist set up rain gauges at various locations around a city and recorded the rainfall amounts in the table below. Use the data in the table to create a line plot using $\frac{1}{8}$ inches.



- a. Which location received the most rainfall?

Location 6

- b. Which location received the least rainfall?

Locations 1, 7, 10

- c. Which rainfall measurement was the most frequent?

$\frac{1}{8}$ in

- d. What is the total rainfall in inches?

5 in

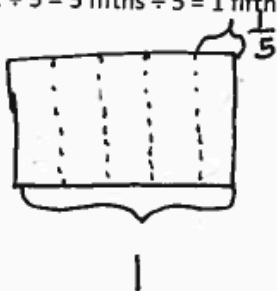
Location	Rainfall Amount (inches)
1	$\frac{1}{8}$
2	$\frac{3}{8}$
3	$\frac{3}{4} \times \frac{2}{2} = \frac{6}{8}$
4	$\frac{3}{4} \times \frac{2}{2} = \frac{6}{8}$
5	$\frac{1}{4} \times \frac{2}{2} = \frac{2}{8}$
6	$1 \frac{1}{4} \times \frac{2}{2} = 1 \frac{2}{8}$
7	$\frac{1}{8}$
8	$\frac{1}{4} \times \frac{2}{2} = \frac{2}{8}$
9	1
10	$\frac{1}{8}$

Name _____

Date _____

1. Draw a picture to show the division. Write a division expression using unit form. Then, express your answer as a fraction. The first one is partially done for you.

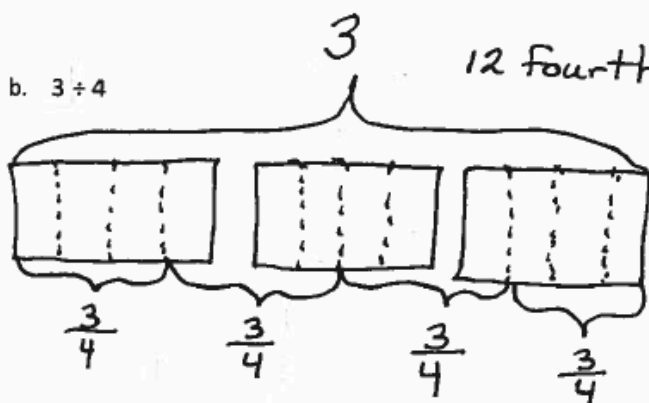
a. $1 \div 5 = 5 \text{ fifths} \div 5 = 1 \text{ fifth} = \frac{1}{5}$



$$\frac{1}{1} \div \frac{5}{1} =$$

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

b. $3 \div 4$



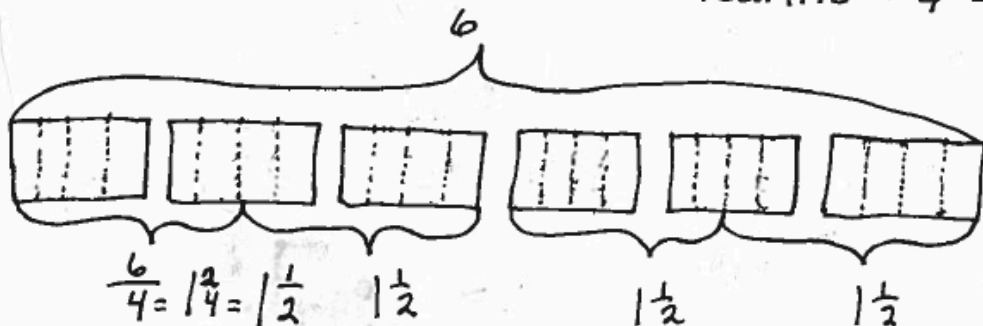
$12 \text{ fourths} \div 4 = 3 \text{ fourths} = \frac{3}{4}$

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

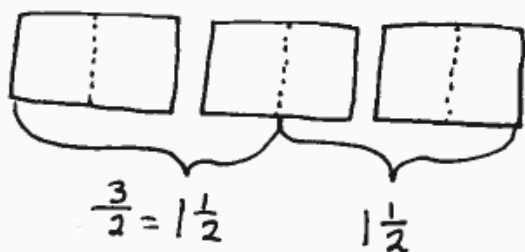
$$\frac{3}{1} \times \frac{1}{4} = \frac{3}{4}$$

c. $6 \div 4$

$24 \text{ fourths} \div 4 = 6 \text{ fourths} = \frac{6}{4} = 1\frac{2}{4} = 1\frac{1}{2}$



2. Draw to show how 2 children can equally share 3 cookies. Write an equation, and express your answer as a fraction.



$$3 \div 2 = 6 \text{ halves} \div 2 = 3 \text{ halves}$$

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

Each child gets $1\frac{1}{2}$ cookies

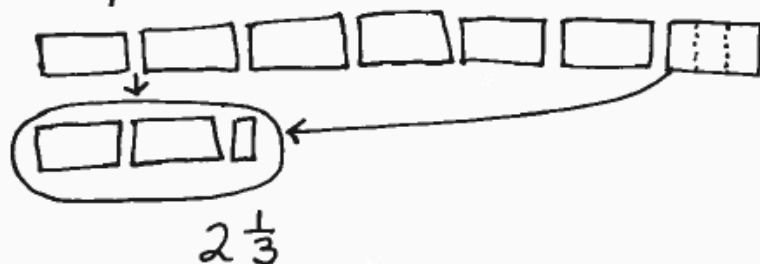
3. Carly and Gina read the following problem in their math class:

Seven cereal bars were shared equally by 3 children. How much did each child receive?

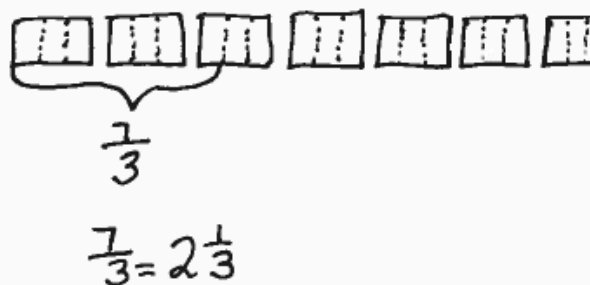
Carly and Gina solve the problem differently. Carly gives each child 2 whole cereal bars and then divides the remaining cereal bar among the 3 children. Gina divides all the cereal bars into thirds and shares the thirds equally among the 3 children.

- a. Illustrate both girls' solutions.

Carly



Gina



- b. Explain why they are both right.

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

a. $2 \div 3 = \frac{2}{3}$

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

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

b. $15 \div 8 = \frac{15}{8} = 1\frac{7}{8}$

$\frac{15}{1} \div \frac{8}{1} =$

$\frac{15}{1} \times \frac{1}{8} = \frac{15}{8}$

c. $11 \div 4 = \frac{11}{4} = 2\frac{3}{4}$

$\frac{11}{1} \div \frac{4}{1} =$

$\frac{11}{1} \times \frac{1}{4} = \frac{11}{4}$

d. $\frac{3}{2} = \underline{3} \div \underline{2}$

e. $\frac{9}{13} = \underline{9} \div \underline{13}$

f. $1\frac{1}{3} = \underline{4} \div \underline{3}$

$\frac{4}{3} = \frac{4}{3}$

Name _____

Date _____

1. Draw a picture to show the division. Express your answer as a fraction.

a. $1 \div 4$

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

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



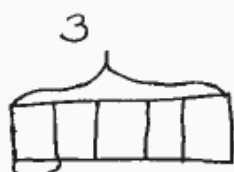
4 units = 1
1 unit = $1 \div 4$

$$1 \text{ unit} = 1 \div 4 \text{ or } \frac{1}{4}$$

b. $3 \div 5$

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

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



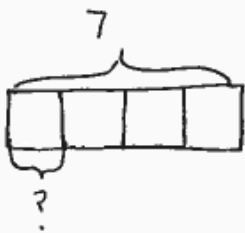
5 units = 3
1 unit = $3 \div 5$

c. $7 \div 4$

$$\frac{7}{1} \div \frac{4}{1} =$$

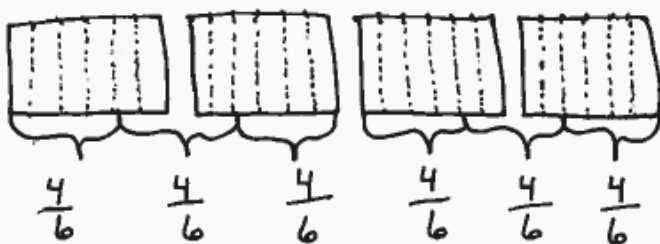
$$\frac{7}{1} \times \frac{1}{4} = \frac{7}{4}$$

$$\frac{7}{4}$$



4 units = 7
1 unit = $7 \div 4$

2. Using a picture, show how six people could share four sandwiches. Then, write an equation and solve.



$$4 \div 6 =$$

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

$$\frac{4}{1} \times \frac{1}{6} = \frac{4}{6}$$

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

a. $2 \div 7 = \underline{\quad}$

$$\frac{2}{1} \div \frac{7}{1} =$$

$$\frac{2}{1} \times \frac{1}{7} = \frac{2}{7}$$

d. $\frac{9}{5} = \underline{9} \div \underline{5}$

b. $39 \div 5 = \underline{\quad}$

$$\frac{39}{1} \div \frac{5}{1} =$$

$$39 \times \frac{1}{5} =$$

$$\frac{39}{5}$$

e. $\frac{19}{28} = \underline{19} \div \underline{28}$

c. $13 \div 3 = \underline{\quad}$

$$\frac{13}{1} \div \frac{3}{1} =$$

$$\frac{13}{1} \times \frac{1}{3} =$$

$$\frac{13}{3}$$

f. $1\frac{3}{5} = \underline{8} \div \underline{5}$

$$\begin{array}{r} + \\ 1\frac{3}{5} \\ \times \\ \hline \end{array} = \frac{8}{5}$$

Name _____

Date _____

1. Fill in the chart. The first one is done for you.

Division Expression	Unit Forms	Improper Fraction	Mixed Numbers	Standard Algorithm (Write your answer in whole numbers and fractional units. Then check.)
a. $5 \div 4$ $\frac{5}{1} \div \frac{4}{1} = 1 \times \frac{4}{4} =$ $\frac{5}{4}$	$20 \text{ fourths} \div 4$ $= 5 \text{ fourths}$	$\frac{5}{4}$	$1\frac{1}{4}$	$4 \overline{) 5} \begin{array}{r} 1\frac{1}{4} \\ -4 \\ \hline 1 \end{array}$ <p style="text-align: right;">Check</p> $4 \times 1\frac{1}{4} = 1\frac{1}{4} + 1\frac{1}{4} + 1\frac{1}{4} + 1\frac{1}{4}$ $= 4 + \frac{4}{4}$ $= 4 + 1$ $= 5$
b. $3 \div 2$ $\frac{3}{1} \div \frac{2}{1} =$ $\frac{3}{1} \times \frac{1}{2} = \frac{3}{2}$	$6 \text{ halves} \div 2$ $= 3 \text{ halves}$	$\frac{3}{2}$	$1\frac{1}{2}$	$2 \overline{) 3} \begin{array}{r} 1\frac{1}{2} \\ -2 \\ \hline 1 \end{array}$ $2 \times 1\frac{1}{2} = 1\frac{1}{2} + 1\frac{1}{2} =$ $2\frac{2}{2} = 2 + 1 =$ 3
c. $6 \div 4$	$24 \text{ fourths} \div 4$ $= 6 \text{ fourths}$	$\frac{6}{4}$	$1\frac{2}{4} = 1\frac{1}{2}$	$4 \overline{) 6} \begin{array}{r} 1\frac{2}{4} \\ -4 \\ \hline 2 \end{array}$ $1\frac{2}{4} \div 2 = 1\frac{1}{2}$ $4 \times 1\frac{1}{2} = 1\frac{1}{2} + 1\frac{1}{2} + 1\frac{1}{2} + 1\frac{1}{2} =$ $4\frac{4}{2} = 4 + 2 =$ 6
d. $5 \div 2$ $\frac{5}{1} \div \frac{2}{1} =$ $\frac{5}{1} \times \frac{1}{2} = \frac{5}{2}$	$10 \text{ halves} \div 2 =$ 5 halves	$\frac{5}{2}$	$2\frac{1}{2}$	$2 \overline{) 5} \begin{array}{r} 2\frac{1}{2} \\ -4 \\ \hline 1 \end{array}$ $2 \times 2\frac{1}{2} = 2\frac{1}{2} + 2\frac{1}{2} =$ $4\frac{2}{2} = 4 + 1 =$ 5

↑ see me for "Unit Forms"

2. A principal evenly distributes 6 reams of copy paper to 8 fifth-grade teachers.
- a. How many reams of paper does each fifth-grade teacher receive? Explain how you know using pictures, words, or numbers.

$$6 \div 8 = \frac{6}{1} \div \frac{8}{1} = \frac{6}{1} \times \frac{1}{8} = \frac{6}{8} \div 2 = \frac{3}{4}$$

Each teacher gets $\frac{3}{4}$ ream of paper

- b. If there were twice as many reams of paper and half as many teachers, how would the amount each teacher receives change? Explain how you know using pictures, words, or numbers.

$$6 \text{ reams} \times 2 = 12 \text{ reams}$$

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

$$8 \text{ teachers} \div 2 = 4 \text{ teachers}$$

Each teacher gets 3 reams of paper

3. A caterer has prepared 16 trays of hot food for an event. The trays are placed in warming boxes for delivery. Each box can hold 5 trays of food.

- a. How many warming boxes are necessary for delivery if the caterer wants to use as few boxes as possible? Explain how you know.

16 trays in groups of 5 trays

$$16 \div 5 = \frac{16}{1} \div \frac{5}{1} = \frac{16}{1} \times \frac{1}{5} = 3\frac{1}{5}$$

It takes $3\frac{1}{5}$ boxes for 16 trays
3 boxes are full. 1 box only has $\frac{1}{5}$.

The caterer will need 4 boxes

- b. If the caterer fills a box completely before filling the next box, what fraction of the last box will be empty?

$$4 - 3\frac{1}{5}$$

$$\begin{array}{r} 4 = 3\frac{5}{5} \\ - 3\frac{1}{5} = -3\frac{1}{5} \\ \hline \end{array}$$

$\frac{4}{5}$ the last box will be $\frac{4}{5}$ empty

Name _____

Date _____

1. Fill in the chart. The first one is done for you.

Division Expression	Unit Forms	Improper Fractions	Mixed Numbers	Standard Algorithm (Write your answer in whole numbers and fractional units. Then check.)
a. $4 \div 3$ $\frac{4}{1} \div \frac{3}{1} =$ $\frac{4}{1} \times \frac{1}{3} = \frac{4}{3}$	$12 \text{ thirds} \div 3$ $= 4 \text{ thirds}$	$\frac{4}{3}$	$1\frac{1}{3}$	$\begin{array}{r} 1\frac{1}{3} \\ 3 \overline{)4} \\ \underline{-3} \\ 1 \end{array}$ Check $3 \times 1\frac{1}{3} = 1\frac{1}{3} + 1\frac{1}{3} + 1\frac{1}{3}$ $= 3 + \frac{3}{3}$ $= 3 + 1$ $= 4$
b. $7 \div 5$ $\frac{7}{1} \div \frac{5}{1} = \frac{7}{5}$	$35 \text{ fifths} \div 5$ $= 7 \text{ fifths}$	$\frac{7}{5}$	$1\frac{2}{5}$	$\begin{array}{r} 1\frac{2}{5} \\ 5 \overline{)7} \\ \underline{-5} \\ 2 \end{array}$ $5 \times 1\frac{2}{5} =$ $\frac{2}{5} + \frac{2}{5} + \frac{2}{5} + \frac{2}{5} + \frac{2}{5} =$ $5\frac{10}{5} = 5 + 2 = 7$
c. $7 \div 2$ $\frac{7}{1} \div \frac{2}{1} = \frac{7}{2}$	$14 \text{ halves} \div 2$ $= 7 \text{ halves}$	$\frac{7}{2}$	$3\frac{1}{2}$	$\begin{array}{r} 3\frac{1}{2} \\ 2 \overline{)7} \\ \underline{-6} \\ 1 \end{array}$ $2 \times 3\frac{1}{2} =$ $3\frac{1}{2} + 3\frac{1}{2} =$ $6\frac{2}{2} = 6 + 1 = 7$
d. $7 \div 4$ $\frac{7}{1} \div \frac{4}{1} = \frac{7}{4}$	$28 \text{ fourths} \div 4 = 7 \text{ fourths}$	$\frac{7}{4}$	$1\frac{3}{4}$	$\begin{array}{r} 1\frac{3}{4} \\ 4 \overline{)7} \\ \underline{-4} \\ 3 \end{array}$ $4 \times 1\frac{3}{4} =$ $1\frac{3}{4} + 1\frac{3}{4} + 1\frac{3}{4} + 1\frac{3}{4} =$ $4\frac{12}{4} = 4 + 3 = 7$

2. A coffee shop uses 4 liters of milk every day.
- a. If there are 15 liters of milk in the refrigerator, after how many days will more milk need to be purchased? Explain how you know.

$$15 \text{ Liters} \div 4 \text{ Liters} = \frac{15}{4} = 3\frac{3}{4} \text{ days}$$

In $3\frac{3}{4}$ days the 15 liters will be used up.

They will need to purchase new milk in 3 days.

- b. If only half as much milk is used each day, after how many days will more milk need to be purchased?

$$15 \text{ Liters} \div 2 \text{ Liters} = \frac{15}{2} = 7\frac{1}{2}$$

In $7\frac{1}{2}$ days the 15 liters will be used up.

They will need to buy milk in 7 days.

3. Polly buys 14 cupcakes for a party. The bakery puts them into boxes that hold 4 cupcakes each.
- a. How many boxes will be needed for Polly to bring all the cupcakes to the party? Explain how you know.

$$14 \text{ cupcakes} \div 4 \text{ in each box} = \frac{14}{4} = 3\frac{2}{4} \div 2 = 3\frac{1}{2}$$

14 cupcakes in groups of 4 will take $3\frac{1}{2}$ boxes

Polly will need 4 boxes.

- b. If the bakery completely fills as many boxes as possible, what fraction of the last box is empty? How many more cupcakes are needed to fill this box?

$$\begin{array}{r} 4 - 3\frac{1}{2} = 4 = 3\frac{2}{2} \\ - 3\frac{1}{2} = -3\frac{1}{2} \\ \hline \frac{1}{2} \end{array}$$

$\frac{1}{2}$ of the last box is empty

Each box holds 4 cupcakes

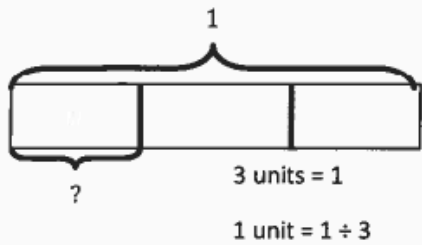
so $\frac{1}{2}$ box holds 2 cupcakes

Name _____

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1. Draw a tape diagram to solve. Express your answer as a fraction. Show the multiplication sentence to check your answer. The first one is done for you.

a. $1 \div 3 = \frac{1}{3}$

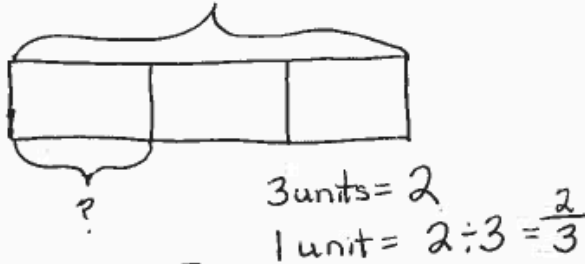


Check: $3 \times \frac{1}{3}$

$$\begin{array}{r} 0 \frac{1}{3} \\ 3 \overline{) 1} \\ \underline{-0} \\ 1 \end{array}$$

$$\begin{aligned} &= \frac{1}{3} + \frac{1}{3} + \frac{1}{3} \\ &= \frac{3}{3} \\ &= 1 \end{aligned}$$

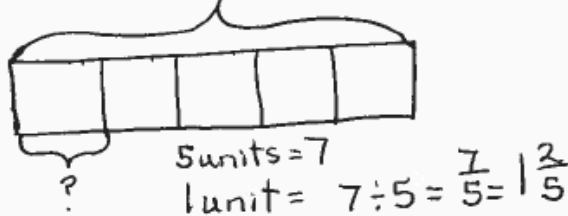
b. $2 \div 3 = \frac{2}{3}$



$$\begin{array}{r} 0 \frac{2}{3} \\ 3 \overline{) 2} \\ \underline{-0} \\ 2 \end{array}$$

$$\begin{aligned} &3 \times \frac{2}{3} = \\ &\frac{2}{3} + \frac{2}{3} + \frac{2}{3} = \frac{6}{3} = 2 \end{aligned}$$

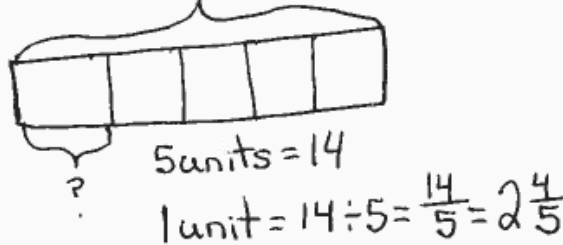
c. $7 \div 5 = 1 \frac{2}{5}$



$$\begin{array}{r} 1 \frac{2}{5} \\ 5 \overline{) 7} \\ \underline{-5} \\ 2 \end{array}$$

$$\begin{aligned} &5 \times 1 \frac{2}{5} = \\ &1 \frac{2}{5} + 1 \frac{2}{5} + 1 \frac{2}{5} + 1 \frac{2}{5} + 1 \frac{2}{5} = \\ &5 + \frac{10}{5} = 5 + 2 = \\ &7 \end{aligned}$$

d. $14 \div 5 = 2 \frac{4}{5}$



$$\begin{array}{r} 2 \frac{4}{5} \\ 5 \overline{) 14} \\ \underline{-10} \\ 4 \end{array}$$

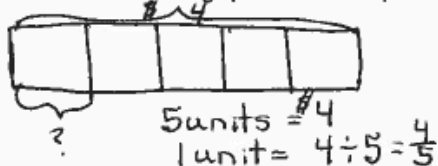
$$\begin{aligned} &5 \times 2 \frac{4}{5} = \\ &2 \frac{4}{5} + 2 \frac{4}{5} + 2 \frac{4}{5} + 2 \frac{4}{5} + 2 \frac{4}{5} = \\ &10 + \frac{20}{5} = 10 + 4 = 14 \end{aligned}$$

2. Fill in the chart. The first one is done for you.

Division Expression	Fraction	Between which two whole numbers is your answer?	Standard Algorithm
a. $13 \div 3$	$\frac{13}{3}$	4 and 5	$ \begin{array}{r} 4 \frac{1}{3} \\ 3 \overline{) 13} \\ \underline{-12} \\ 1 \end{array} $
b. $6 \div 7$	$\frac{6}{7}$	0 and 1	$ \begin{array}{r} 0 \frac{6}{7} \\ 7 \overline{) 6} \\ \underline{-0} \\ 6 \end{array} $
c. $55 \div 10$	$\frac{55}{10}$	5 and 6	$ \begin{array}{r} 5 \frac{5}{10} = 5 \frac{1}{2} \\ 10 \overline{) 55} \\ \underline{-50} \\ 5 \end{array} $
d. $32 \div 40$	$\frac{32}{40}$	0 and 1	$ \begin{array}{r} 0 \frac{32}{40} \\ 40 \overline{) 32} \\ \underline{-0} \\ 32 \end{array} $

3. Greg spent \$4 on 5 packs of sport cards.

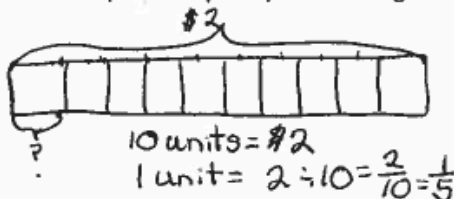
a. How much did Greg spend on each pack?



$$\frac{4}{5} \text{ of } \$1 =$$

$$\frac{4}{5} \text{ of } 100 = \frac{4}{5} \times \frac{100}{1} = \frac{400}{5} = 80 \text{¢}$$

b. If Greg spent half as much money and bought twice as many packs of cards, how much did he spend on each pack? Explain your thinking.



$$\frac{1}{5} \text{ of } \$1 =$$

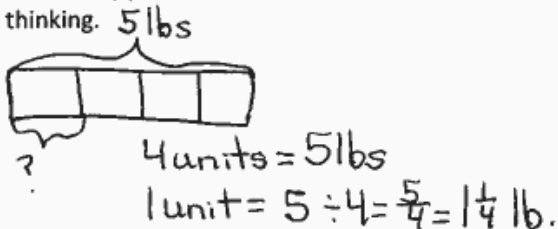
$$\frac{1}{5} \times 100 = \frac{1}{5} \times \frac{100}{1} = \frac{100}{5} = 20 \text{¢}$$

4. Five pounds of birdseed is used to fill 4 identical bird feeders.

a. What fraction of the birdseed will be needed to fill each feeder?

There are 4 bird feeders, so each will get $\frac{1}{4}$ of the birdseed.

b. How many pounds of birdseed are used to fill each feeder? Draw a tape diagram to show your thinking.



c. How many ounces of birdseed are used to fill three bird feeders?

$$1 \text{ lb} = 16 \text{ oz}$$

$$1 \frac{1}{4} \text{ lb} = 1 + \frac{1}{4} \text{ lb} =$$

$$16 \text{ oz} + \frac{1}{4} \text{ lb} =$$

$$16 \text{ oz} + \frac{1}{4} \text{ of } 16 =$$

$$16 \text{ oz} + \left(\frac{1}{4} \times 16\right) = \frac{16}{4} = 4 \text{ oz}$$

$$16 \text{ oz} + 4 \text{ oz} = 20 \text{ oz}$$

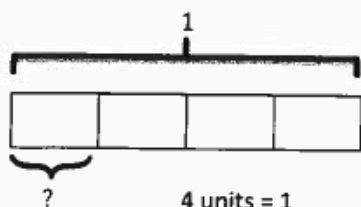
$$20 \text{ oz} \times 3 \text{ feeders} = 60 \text{ oz}$$

Name _____

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1. Draw a tape diagram to solve. Express your answer as a fraction. Show the addition sentence to support your answer. The first one is done for you.

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



$1 \text{ unit} = 1 \div 4$

$= \frac{1}{4}$

Check:

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

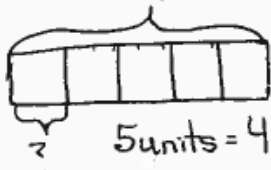
$= \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$

$= \frac{4}{4}$

$= 1$

$$\begin{array}{r} 0 \frac{1}{4} \\ 4 \overline{) 1} \\ \underline{- 0} \\ 1 \end{array}$$

b. $4 \div 5 = \frac{4}{5}$



$1 \text{ unit} = 4 \div 5 = \frac{4}{5}$

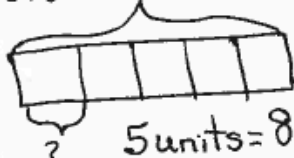
$$\begin{array}{r} 0 \frac{4}{5} \\ 5 \overline{) 4} \\ \underline{- 0} \\ 4 \end{array}$$

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

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

$\frac{20}{5} = 4$

c. $8 \div 5 = 1 \frac{3}{5}$



$1 \text{ unit} = 8 \div 5 =$

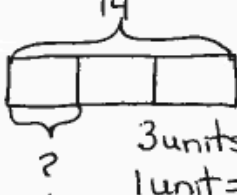
$1 \frac{3}{5}$

$$\begin{array}{r} 1 \frac{3}{5} \\ 5 \overline{) 8} \\ \underline{- 5} \\ 3 \end{array}$$

$5 \times 1 \frac{3}{5} =$
 $1 \frac{3}{5} + 1 \frac{3}{5} + 1 \frac{3}{5} + 1 \frac{3}{5} + 1 \frac{3}{5} =$

$5 \frac{15}{5} = 5 + 3 = 8$

d. $14 \div 3 = 4 \frac{2}{3}$



$1 \text{ unit} = 14 \div 3 =$

$4 \frac{2}{3}$

$$\begin{array}{r} 4 \frac{2}{3} \\ 3 \overline{) 14} \\ \underline{- 12} \\ 2 \end{array}$$

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

$4 \frac{2}{3} + 4 \frac{2}{3} + 4 \frac{2}{3} =$

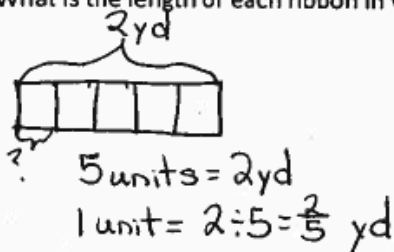
$12 \frac{6}{3} = 12 + 2 = 14$

2. Fill in the chart. The first one is done for you.

Division Expression	Fraction	Between which two whole numbers is your answer?	Standard Algorithm
a. $16 \div 5$	$\frac{16}{5}$	3 and 4	$ \begin{array}{r} 3 \frac{1}{5} \\ 5 \overline{) 16} \\ \underline{-15} \\ 1 \end{array} $
b. $3 \div 4$	$\frac{3}{4}$	0 and 1	$ \begin{array}{r} 0 \frac{3}{4} \\ 4 \overline{) 3} \\ \underline{-0} \\ 3 \end{array} $
c. $7 \div 2$	$\frac{7}{2}$	3 and 4	$ \begin{array}{r} 3 \frac{1}{2} \\ 2 \overline{) 7} \\ \underline{-6} \\ 1 \end{array} $
d. $81 \div 90$	$\frac{81}{90}$	0 and 1	$ \begin{array}{r} 0 \frac{81}{90} \\ 90 \overline{) 81} \\ \underline{-0} \\ 81 \end{array} $

3. Jackie cut a 2-yard spool into 5 equal lengths of ribbon.

a. What is the length of each ribbon in yards? Draw a tape diagram to show your thinking.



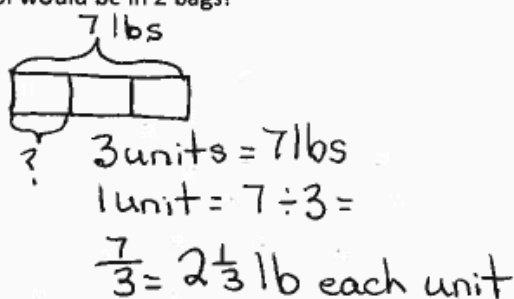
b. What is the length of each ribbon in feet? Draw a tape diagram to show your thinking.

$$\frac{2}{5} \text{ yd} = \frac{2}{5} \text{ of } 3 = \frac{2}{5} \times \frac{3}{1} = \frac{6}{5} \text{ ft}$$

$$1 \text{ yd} = 3 \text{ ft}$$

$$1 \frac{1}{5} \text{ ft}$$

4. Baa Baa, the black sheep, had 7 pounds of wool. If he separated the wool equally into 3 bags, how much wool would be in 2 bags?

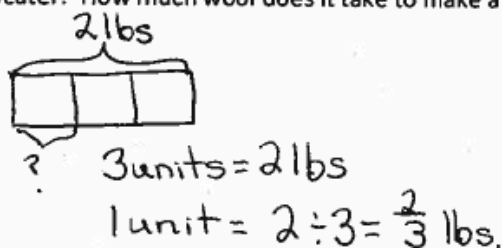


$$2 \times 2 \frac{1}{3} =$$

$$2 \frac{1}{3} + 2 \frac{1}{3} =$$

$4 \frac{2}{3}$ lb in two bags

5. An adult sweater is made from 2 pounds of wool. This is 3 times as much wool as it takes to make a baby sweater. How much wool does it take to make a baby sweater? Use a tape diagram to solve.

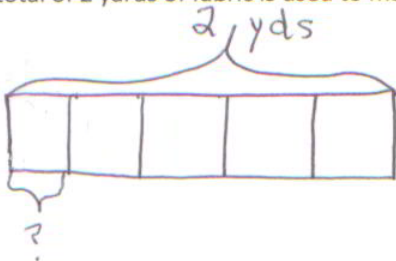


It takes $\frac{2}{3}$ lbs wool to make one baby sweater

Name _____

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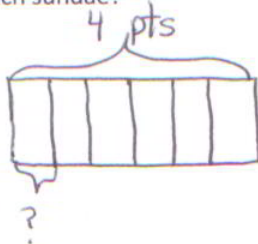
1. A total of 2 yards of fabric is used to make 5 identical pillows. How much fabric is used for each pillow?



$$5 \text{ units} = 2 \text{ yds}$$

$$1 \text{ unit} = 2 \div 5 = \frac{2}{5} \text{ yd fabric used for each pillow}$$

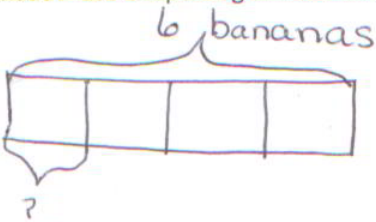
2. An ice cream shop uses 4 pints of ice cream to make 6 sundaes. How many pints of ice cream are used for each sundae?



$$6 \text{ units} = 4 \text{ pts}$$

$$1 \text{ unit} = 4 \div 6 = \frac{4}{6} \text{ pint or } \frac{2}{3} \text{ pint used for each sundae}$$

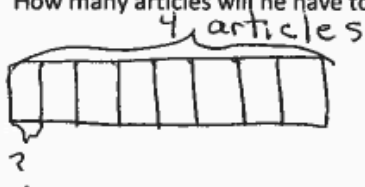
3. An ice cream shop uses 6 bananas to make 4 identical sundaes. How many bananas are used in each sundae? Use a tape diagram to show your work.



$$4 \text{ units} = 6 \text{ bananas}$$

$$1 \text{ unit} = 6 \div 4 = \frac{6}{4} = 1 \frac{2}{4} = 1 \frac{1}{2} \text{ banana in each sundae}$$

4. Julian has to read 4 articles for school. He has 8 nights to read them. He decides to read the same number of articles each night.
- a. How many articles will he have to read per night?



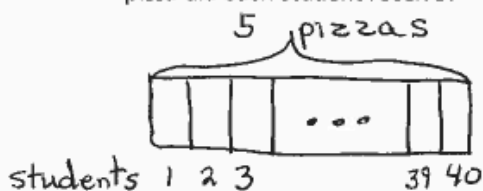
$$8 \text{ units} = 4 \text{ articles}$$

$$1 \text{ unit} = 4 \div 8 = \frac{4}{8} = \frac{1}{2} \text{ article read each night}$$

- b. What fraction of the reading assignment will he read each night?

Since Julian is reading 8 nights, he reads $\frac{1}{8}$ of the total each night

5. 40 students shared 5 pizzas equally. How much pizza will each student receive? What fraction of the pizza did each student receive?

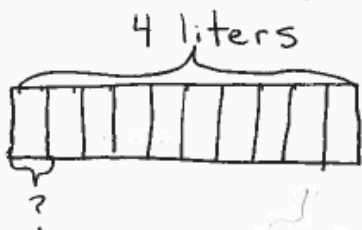


$$40 \text{ units} = 5 \text{ pizzas}$$

$$1 \text{ unit} = 5 \div 40 = \frac{5}{40} = \frac{1}{8}$$

Each student receives $\frac{1}{8}$ of a pizza

6. Lillian had 2 two-liter bottles of soda, which she distributed equally between 10 glasses.
- a. How much soda was in each glass? Express your answer as a fraction of a liter.



$$10 \text{ units} = 4 \text{ liters}$$

$$1 \text{ unit} = 4 \div 10 = \frac{4}{10} = \frac{2}{5} \text{ liter in each glass}$$

- b. Express your answer as a decimal number of liters.

$$\frac{4}{10} = .4 \text{ Liter in each glass}$$

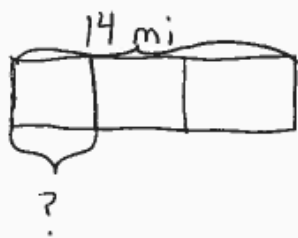
- c. Express your answer as a whole number of milliliters.

$$1 \text{ liter} = 1,000 \text{ mL.}$$

$$.4 \times 1000 = 400 \text{ mL of soda in each glass}$$

7. The Calef family likes to paddle along the Susquehanna River.

- a. They paddled the same distance each day over the course of 3 days, traveling a total of 14 miles. How many miles did they travel each day? Show your thinking in a tape diagram.



$$3 \text{ units} = 14 \text{ miles}$$

$$1 \text{ unit} = 14 \div 3 = \frac{14}{3} = 4\frac{2}{3} \text{ mile each day}$$

- b. If the Calefs went half their daily distance each day but extended their trip to twice as many days, how far would they travel?

$$\text{Twice the days} = 3 \text{ days} \times 2 = 6 \text{ days}$$

$$\text{Half the distance} = 2\frac{1}{3} \text{ mile each day}$$

$$\begin{array}{c} 4\frac{2}{3} \\ / \quad \backslash \\ 2\frac{1}{3} \quad 2\frac{1}{3} \end{array}$$

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

$$12\frac{6}{3} = 12 + 2 = 14$$

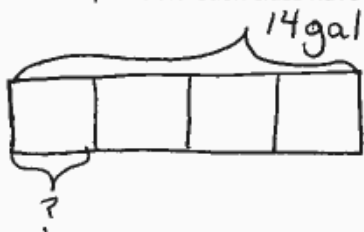
They would still travel 14 miles

Name _____

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1. When someone donated 14 gallons of paint to Rosendale Elementary School, the fifth grade decided to use it to paint murals. They split the gallons equally among the four classes.

- a. How much paint did each class have to paint their mural?



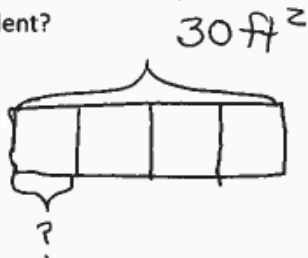
$$4 \text{ units} = 14 \text{ gallons}$$

$$1 \text{ unit} = \frac{14}{4} = 3\frac{2}{4} = 3\frac{1}{2} \text{ gallons}$$

- b. How much paint will three classes use? Show your thinking using words, numbers, or pictures.

$$3\frac{1}{2} \times 3 = 3\frac{1}{2} + 3\frac{1}{2} + 3\frac{1}{2} = 9\frac{3}{2} = 10\frac{1}{2} \text{ gallons}$$

- c. If 4 students share a 30-square-foot wall equally, how many square feet of the wall will be painted by each student?



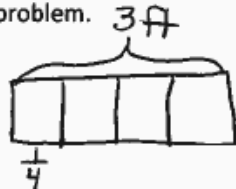
$$4 \text{ units} = 30 \text{ ft}^2$$

$$1 \text{ unit} = \frac{30}{4} = 7\frac{2}{4} = 7\frac{1}{2} \text{ ft}^2$$

- d. What fraction of the wall will each student paint?

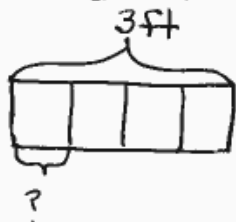
Each student paints $\frac{1}{4}$ of the wall

2. Craig bought a 3-foot-long baguette and then made 4 equally sized sandwiches with it.
- a. What portion of the baguette was used for each sandwich? Draw a visual model to help you solve this problem.



Each sandwich used $\frac{1}{4}$ of the baguette

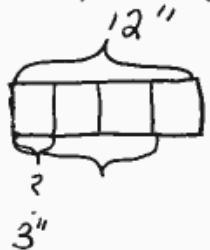
- b. How long, in feet, is one of Craig's sandwiches?



$$4 \text{ units} = 3 \text{ ft}$$

$$1 \text{ unit} = \frac{3}{4} \text{ ft}$$

- c. How many inches long is one of Craig's sandwiches?

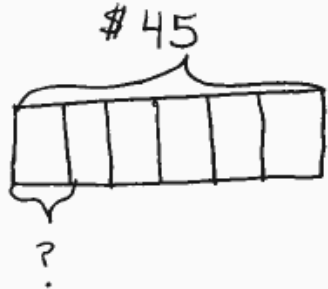


$$4 \text{ units} = 12''$$

$$1 \text{ unit} = \frac{12}{4} = 3''$$

$$3 \text{ units} \times 3'' = 9''$$

3. Scott has 6 days to save enough money for a \$45 concert ticket. If he saves the same amount each day, what is the minimum amount he must save each day in order to reach his goal? Express your answer in dollars.



$$6 \text{ units} = \$45$$

$$1 \text{ unit} = \frac{45}{6} = 7\frac{3}{6} = 7\frac{1}{2} \text{ or } \$7.50$$

Lesson 6

Sprint

Side A

- | | | | |
|--------------------|--------------------|--------------------|--------------------|
| 1. $\frac{1}{2}$ | 12. $1\frac{2}{5}$ | 23. 3 | 34. $2\frac{1}{6}$ |
| 2. $\frac{1}{3}$ | 13. $1\frac{4}{5}$ | 24. $3\frac{1}{2}$ | 35. $4\frac{2}{7}$ |
| 3. $\frac{1}{8}$ | 14. $\frac{2}{3}$ | 25. 1 | 36. $3\frac{3}{8}$ |
| 4. 1 | 15. 1 | 26. $1\frac{1}{8}$ | 37. $5\frac{4}{9}$ |
| 5. $\frac{2}{3}$ | 16. $1\frac{1}{4}$ | 27. $1\frac{7}{8}$ | 38. $4\frac{5}{6}$ |
| 6. 1 | 17. $1\frac{3}{4}$ | 28. 2 | 39. $6\frac{5}{7}$ |
| 7. $\frac{3}{4}$ | 18. 2 | 29. $2\frac{3}{4}$ | 40. $6\frac{5}{8}$ |
| 8. $\frac{3}{10}$ | 19. $2\frac{1}{2}$ | 30. $7\frac{1}{2}$ | 41. $7\frac{4}{9}$ |
| 9. $\frac{3}{5}$ | 20. 2 | 31. $4\frac{4}{5}$ | 42. $9\frac{5}{6}$ |
| 10. 1 | 21. $2\frac{1}{5}$ | 32. $4\frac{1}{4}$ | 43. $7\frac{7}{8}$ |
| 11. $1\frac{1}{5}$ | 22. $2\frac{3}{5}$ | 33. $6\frac{2}{3}$ | 44. $7\frac{8}{9}$ |

Side B

- | | | | |
|--------------------|---------------------|--------------------|--------------------|
| 1. $\frac{1}{3}$ | 12. 1 | 23. 3 | 34. $3\frac{1}{6}$ |
| 2. $\frac{1}{4}$ | 13. $1\frac{1}{2}$ | 24. $3\frac{1}{5}$ | 35. $4\frac{3}{7}$ |
| 3. $\frac{1}{10}$ | 14. $\frac{4}{5}$ | 25. 1 | 36. $4\frac{5}{8}$ |
| 4. 1 | 15. 1 | 26. $1\frac{1}{6}$ | 37. $5\frac{5}{9}$ |
| 5. $\frac{5}{6}$ | 16. $1\frac{1}{10}$ | 27. $1\frac{5}{6}$ | 38. $2\frac{5}{6}$ |
| 6. 1 | 17. $1\frac{3}{10}$ | 28. 2 | 39. $6\frac{6}{7}$ |
| 7. $\frac{3}{7}$ | 18. 2 | 29. $2\frac{2}{3}$ | 40. $6\frac{3}{8}$ |
| 8. $\frac{3}{10}$ | 19. $2\frac{1}{5}$ | 30. $6\frac{1}{2}$ | 41. $7\frac{5}{9}$ |
| 9. $\frac{3}{4}$ | 20. $2\frac{3}{5}$ | 31. $4\frac{3}{5}$ | 42. $8\frac{5}{6}$ |
| 10. 1 | 21. 2 | 32. $3\frac{3}{4}$ | 43. $7\frac{5}{8}$ |
| 11. $1\frac{1}{4}$ | 22. $2\frac{1}{2}$ | 33. $4\frac{3}{4}$ | 44. $7\frac{7}{9}$ |

Name _____

Date _____

1. Find the value of each of the following.



$$\frac{1}{3} \text{ of } 9 = 3$$

$$\frac{2}{3} \text{ of } 9 = 6$$

$$\frac{3}{3} \text{ of } 9 = 9$$



$$\frac{1}{3} \text{ of } 15 = 5$$

$$\frac{2}{3} \text{ of } 15 = 10$$

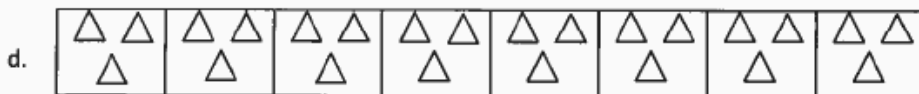
$$\frac{3}{3} \text{ of } 15 = 15$$



$$\frac{1}{5} \text{ of } 20 = 4$$

$$\frac{4}{5} \text{ of } 20 = 16$$

$$\frac{5}{5} \text{ of } 20 = 20$$



$$\frac{1}{8} \text{ of } 24 = 3$$

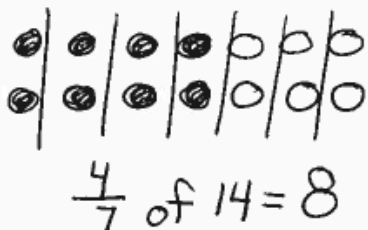
$$\frac{6}{8} \text{ of } 24 = 18$$

$$\frac{3}{8} \text{ of } 24 = 9$$

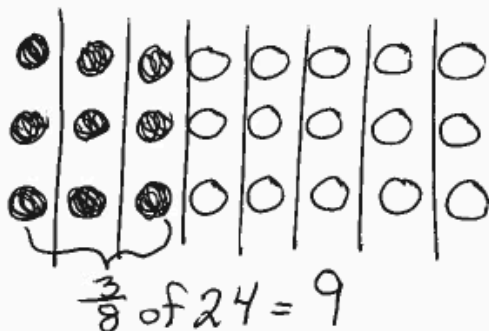
$$\frac{7}{8} \text{ of } 24 = 21$$

$$\frac{4}{8} \text{ of } 24 = 12$$

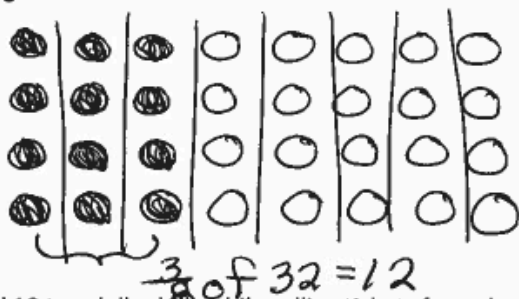
2. Find $\frac{4}{7}$ of 14. Draw a set, and shade to show your thinking.



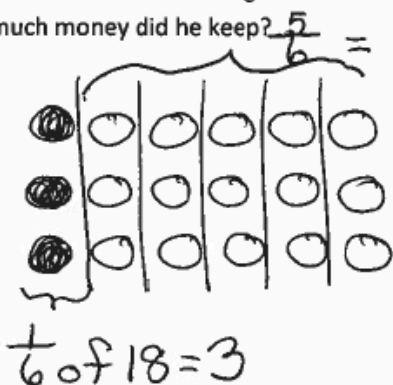
3. How does knowing $\frac{1}{8}$ of 24 help you find three-eighths of 24? Draw a picture to explain your thinking.



4. There are 32 students in a class. Of the class, $\frac{3}{8}$ of the students bring their own lunches. How many students bring their lunches?



5. Jack collected 18 ten-dollar bills while selling tickets for a show. He gave $\frac{1}{6}$ of the bills to the theater and kept the rest. How much money did he keep? $\frac{5}{6}$ of 18 = 15



Jack kept 15 ten dollar bills, which is \$150

Name _____

Date _____

1. Find the value of each of the following.

a.



$$\frac{1}{3} \text{ of } 12 = 4$$

$$\frac{2}{3} \text{ of } 12 = 8$$

$$\frac{3}{3} \text{ of } 12 = 12$$

b.



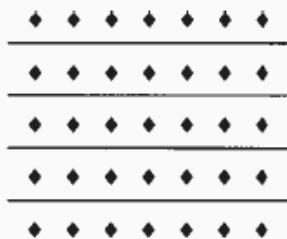
$$\frac{1}{4} \text{ of } 20 = 5$$

$$\frac{3}{4} \text{ of } 20 = 15$$

$$\frac{2}{4} \text{ of } 20 = 10$$

$$\frac{4}{4} \text{ of } 20 = 20$$

c.



$$\frac{1}{5} \text{ of } 35 = 7$$

$$\frac{3}{5} \text{ of } 35 = 21$$

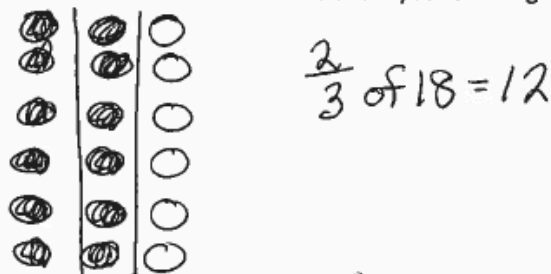
$$\frac{5}{5} \text{ of } 35 = 35$$

$$\frac{2}{5} \text{ of } 35 = 14$$

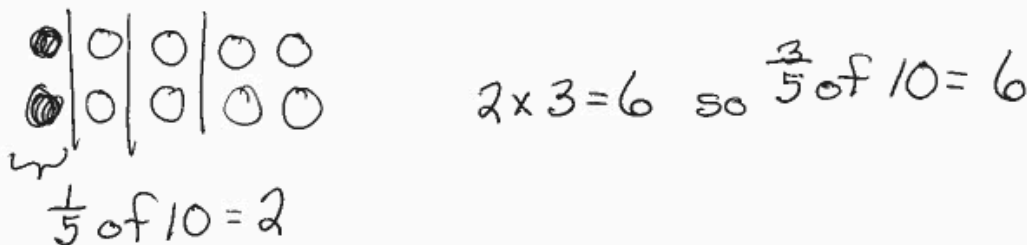
$$\frac{4}{5} \text{ of } 35 = 28$$

$$\frac{6}{5} \text{ of } 35 = 42$$

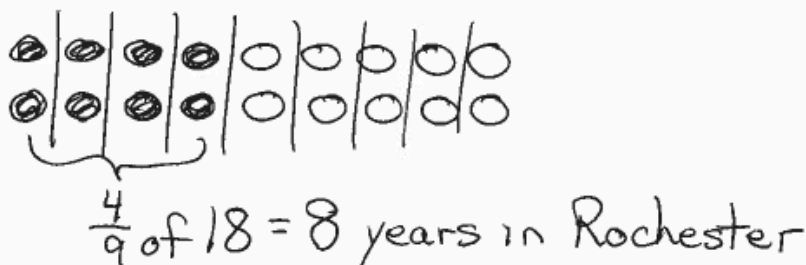
2. Find $\frac{2}{3}$ of 18. Draw a set and shade to show your thinking.



3. How does knowing $\frac{1}{5}$ of 10 help you find $\frac{3}{5}$ of 10? Draw a picture to explain your thinking.

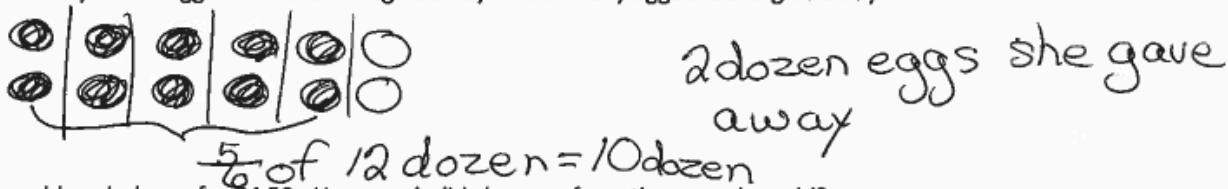


4. Sara just turned 18 years old. She spent $\frac{4}{9}$ of her life living in Rochester, NY. How many years did Sara live in Rochester?



5. A farmer collected 12 dozen eggs from her chickens. She sold $\frac{5}{6}$ of the eggs at the farmers' market and gave the rest to friends and neighbors.

- a. How many dozen eggs did the farmer give away? How many eggs did she give away?



- b. She sold each dozen for \$4.50. How much did she earn from the eggs she sold?

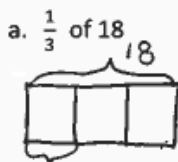
$$\begin{array}{r} 4.50 \\ \times 10 \\ \hline \end{array}$$

\$45 she earned on 10 dozen eggs

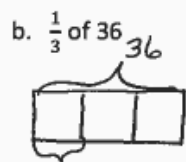
Name _____

Date _____

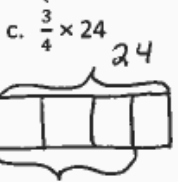
1. Solve using a tape diagram.



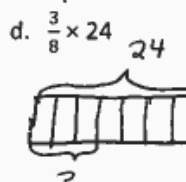
3 units = 18
 1 unit = $18 \div 3 =$
 $\frac{18}{3} = 6$



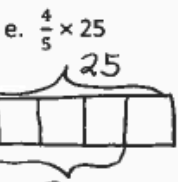
3 units = 36
 1 unit = $36 \div 3 =$
 $\frac{36}{3} = 12$



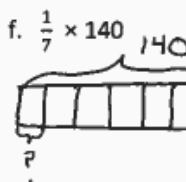
4 units = 24
 units = $24 \div 4 =$
 $\frac{24}{4} = 6$ each unit



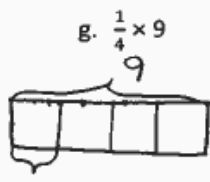
8 units = 24
 1 unit = $\frac{24}{8} =$
 1 unit = 3
 $3 \times 3 = 9$



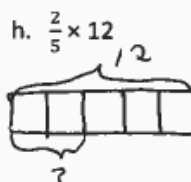
5 units = 25
 1 unit = $\frac{25}{5} = 5$
 $4 \times 5 = 20$



7 units = 140
 1 unit = $\frac{140}{7} = 20$

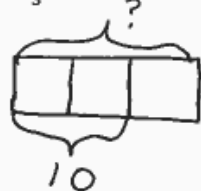


4 units = 9
 1 unit = $\frac{9}{4}$
 $\frac{9}{4} = 2\frac{1}{4}$



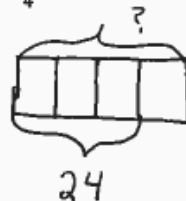
5 units = 12
 1 unit = $\frac{12}{5} = 2\frac{2}{5}$
 $2\frac{2}{5} + 2\frac{2}{5} = 4\frac{4}{5}$

i. $\frac{2}{3}$ of a number is 10. What's the number?



2 units = 10
 1 unit = $\frac{10}{2} = 5$
 3 units $\times 5 = 15$

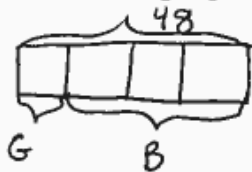
j. $\frac{3}{4}$ of a number is 24. What's the number?



3 units = 24
 1 unit = $\frac{24}{3} = 8$
 4 units = $4 \times 8 = 32$

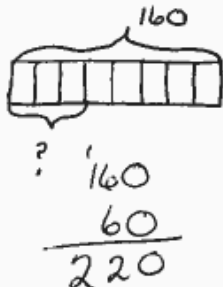
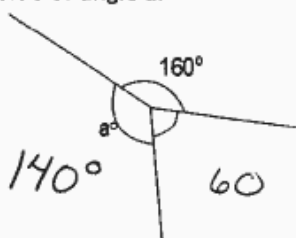
2. Solve using tape diagrams.

- a. There are 48 students going on a field trip. One-fourth are girls. How many boys are going on the trip?



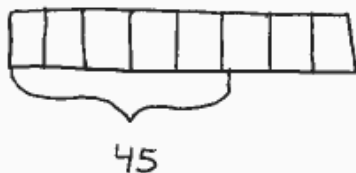
$$\begin{aligned} 4 \text{ units} &= 48 \\ 1 \text{ unit} &= \frac{48}{4} = 12 \\ 3 \text{ units} \times 12 &= 36 \end{aligned}$$

- b. Three angles are labeled below with arcs. The smallest angle is $\frac{3}{8}$ as large as the 160° angle. Find the value of angle a.



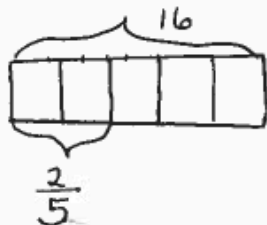
$$\begin{aligned} 8 \text{ units} &= 160 \\ 1 \text{ unit} &= \frac{160}{8} = 20 \\ 3 \text{ units} \times 20 &= 60 \\ 360 - 220 &= 140^\circ \end{aligned}$$

- c. Abbie spent $\frac{5}{8}$ of her money and saved the rest. If she spent \$45, how much money did she have at first?



$$\begin{aligned} 5 \text{ units} &= 45 \\ 1 \text{ unit} &= \frac{45}{5} = 9 \\ 8 \text{ units} &= 8 \times 9 = 72 \end{aligned}$$

- d. Mrs. Harrison used 16 ounces of dark chocolate while baking. She used $\frac{2}{5}$ of the chocolate to make some frosting and used the rest to make brownies. How much more chocolate did Mrs. Harrison use in the brownies than in the frosting?



$$\begin{aligned} 5 \text{ units} &= 16 \\ 1 \text{ unit} &= \frac{16}{5} = 3\frac{1}{5} \\ 2 \text{ units} &= 3\frac{1}{5} + 3\frac{1}{5} = 6\frac{2}{5} \end{aligned}$$

$$\begin{aligned} 3 \text{ units} &= 3\frac{1}{5} + 3\frac{1}{5} + 3\frac{1}{5} = 9\frac{3}{5} \\ &9\frac{3}{5} \\ &- 6\frac{2}{5} \\ &\hline &3\frac{1}{5} \end{aligned}$$


answer
→


Mrs. Harrison used $3\frac{1}{5}$ more ounces of chocolate in brownies than in frosting

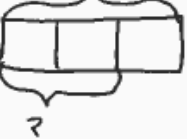
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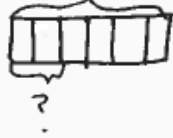
Date _____

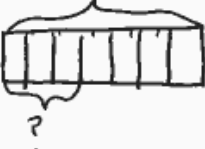
1. Solve using a tape diagram.


a. $\frac{1}{4}$ of 24 24

 4 units = 24
 1 unit = $24 \div 4 =$
 $\frac{24}{4} = 6$


b. $\frac{1}{4}$ of 48 48

 4 units = 48
 1 unit = $\frac{48}{4} =$
 12


c. $\frac{2}{3} \times 18$ 18

 3 units = 18
 1 unit = $\frac{18}{3} = 6$
 2 units $\times 6 = 12$

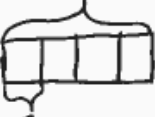
d. $\frac{2}{6} \times 18$ 18

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


e. $\frac{3}{7} \times 49$ 49

 7 units = 49
 1 unit = $\frac{49}{7} = 7$
 3 units = $7 \times 3 =$
 21


f. $\frac{3}{10} \times 120$ 120

 10 units = 120
 1 unit = $\frac{120}{10} = 12$
 3 units $\times 12 = 36$

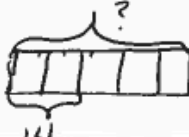
g. $\frac{1}{3} \times 31$ 31

 3 units = 31
 1 unit = $\frac{31}{3} = 10\frac{1}{3}$

h. $\frac{2}{5} \times 20$ 20

 5 units = 20
 1 unit = $\frac{20}{5} = 4$
 2 units $\times 4 = 8$

i. $\frac{1}{4} \times 25$ 25

 4 units = 25
 1 unit = $\frac{25}{4} =$
 $6\frac{1}{4}$

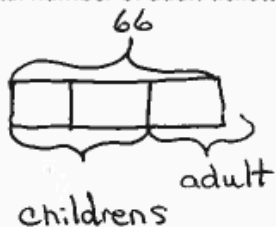
j. $\frac{3}{4} \times 25$ 25

 4 units = 25
 1 unit = $\frac{25}{4} = 6\frac{1}{4}$
 3 units = $6\frac{1}{4} + 6\frac{1}{4} + 6\frac{1}{4} = 18\frac{3}{4}$

k. $\frac{3}{4}$ of a number is 27. What's the number?

 3 units = 27
 1 unit = $\frac{27}{3} = 9$
 4 units = $9 \times 4 = 36$

l. $\frac{2}{5}$ of a number is 14. What's the number?

 2 units = 14
 1 unit = $\frac{14}{2} = 7$
 5 units = $7 \times 5 = 35$

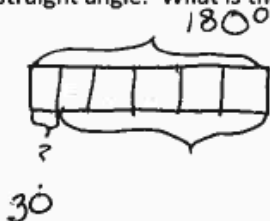
2. Solve using tape diagrams.

- a. A skating rink sold 66 tickets. Of these, $\frac{2}{3}$ were children's tickets, and the rest were adult tickets. What total number of adult tickets were sold?



$$\begin{aligned} 3 \text{ units} &= 66 \\ 1 \text{ unit} &= \frac{66}{3} = 22 \\ 2 \text{ units} \times 22 &= 44 \text{ children's} \\ 1 \text{ unit} \times 22 &= 22 \text{ adult} \end{aligned}$$

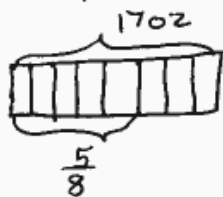
- b. A straight angle is split into two smaller angles as shown. The smaller angle's measure is $\frac{1}{6}$ that of a straight angle. What is the value of angle a?



$$\begin{aligned} 6 \text{ units} &= 180 \\ 1 \text{ unit} &= \frac{180}{6} = 30 \\ 5 \text{ units} \times 30 &= 150 \\ \text{angle } a &= 150^\circ \end{aligned}$$



- c. Annabel and Eric made 17 ounces of pizza dough. They used $\frac{5}{8}$ of the dough to make a pizza and used the rest to make calzones. What is the difference between the amount of dough they used to make pizza and the amount of dough they used to make calzones?

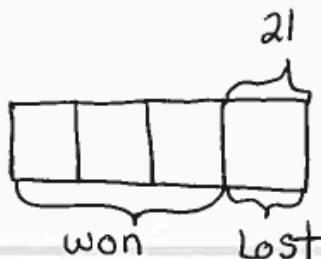


$$\begin{aligned} 8 \text{ units} &= 17 \\ 1 \text{ unit} &= \frac{17}{8} = 2\frac{1}{8} \\ 5 \text{ units} &= 2\frac{1}{8} + 2\frac{1}{8} + 2\frac{1}{8} + 2\frac{1}{8} + 2\frac{1}{8} = 10\frac{5}{8} \text{ for pizza} \\ 3 \text{ units} &= 2\frac{1}{8} + 2\frac{1}{8} + 2\frac{1}{8} = 6\frac{3}{8} \text{ for calzones} \end{aligned}$$

$$\begin{aligned} 10\frac{5}{8} \\ - 6\frac{3}{8} \\ \hline 4\frac{2}{8} = 4\frac{1}{4} \end{aligned}$$

Is the difference

- d. The New York Rangers hockey team won $\frac{3}{4}$ of their games last season. If they lost 21 games, how many games did they play in the entire season?



$$\begin{aligned} 1 \text{ unit} &= 21 \text{ games lost} \\ 21 \times 3 &= 63 \text{ games won} \\ 21 + 63 &= 84 \text{ games total} \end{aligned}$$

or $21 \times 4 = 84$ games

Name _____

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1. Laura and Sean find the product of $\frac{2}{3} \times 4$ using different methods.

Laura: It's 2 thirds of 4.

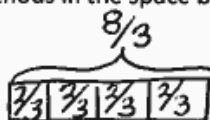
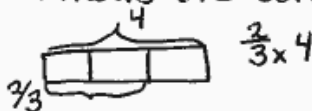
Sean: It's 4 groups of 2 thirds.

$$\frac{2}{3} \times 4 = \frac{4}{3} + \frac{4}{3} = 2 \times \frac{4}{3} = \frac{8}{3}$$

$$\frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3} = 4 \times \frac{2}{3} = \frac{8}{3}$$

Use words, pictures, or numbers to compare their methods in the space below.

Both methods are correct.



2. Rewrite the following addition expressions as fractions as shown in the example.

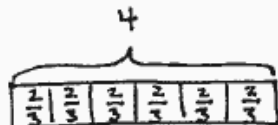
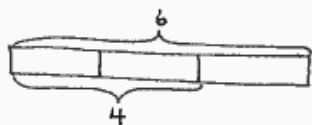
Example: $\frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3} = \frac{4 \times 2}{3} = \frac{8}{3}$

a. $\frac{7}{4} + \frac{7}{4} + \frac{7}{4} = \frac{3 \times 7}{4} = \frac{21}{4}$

b. $\frac{14}{5} + \frac{14}{5} = \frac{2 \times 14}{5} = \frac{28}{5}$

c. $\frac{4}{7} + \frac{4}{7} + \frac{4}{7} = \frac{3 \times 4}{7} = \frac{12}{7}$

3. Solve and model each problem as a fraction of a set and as repeated addition.



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

$6 \times \frac{2}{3} = \frac{6 \times 2}{3} = 4$

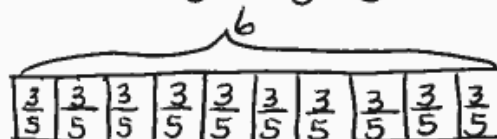
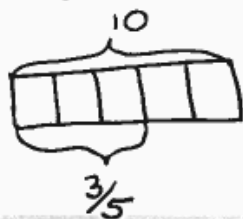
a. $\frac{1}{2} \times 8 = 1 \times \frac{8}{2} = 1 \times 4 = 4$

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



b. $\frac{3}{5} \times 10 = 3 \times \frac{10}{5} = 3 \times 2 = 6$

$10 \times \frac{3}{5} = \frac{10 \times 3}{5} = \frac{30}{5} = 6$



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

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

$6 \times \frac{2}{3} = \frac{\cancel{6}^2 \times 2}{\cancel{3}_1} = 4$

a. $14 \times \frac{3}{7} = \frac{14 \times 3}{7} = \frac{7 \times 2 \times 3}{7} = \frac{7 \times 6}{7} = 6$

$14 \times \frac{3}{7} = \frac{\cancel{14}^2 \times 3}{\cancel{7}_1} = \frac{2 \times 3}{1} = 6$

b. $\frac{3}{4} \times 36 = \frac{3 \times 4 \times 9}{4} = \frac{4 \times 27}{4} = 27$

$\frac{3}{4} \times 36 = \frac{3 \times \cancel{36}^9}{\cancel{4}_1} = \frac{3 \times 9}{1} = 27$

c. $30 \times \frac{13}{10} = \frac{30 \times 13}{10} = \frac{10 \times 3 \times 13}{10} = \frac{10 \times 39}{10} = 39$

$30 \times \frac{13}{10} = \frac{\cancel{30}^3 \times 13}{\cancel{10}_1} = \frac{3 \times 13}{1} = 39$

d. $\frac{9}{8} \times 32 = \frac{9 \times 32}{8} = \frac{9 \times 4 \times 8}{8} = \frac{36 \times 8}{8} = 36$

$\frac{9}{8} \times 32 = \frac{9 \times \cancel{32}^4}{\cancel{8}_1} = \frac{9 \times 4}{1} = 36$

5. Solve each problem any way you choose.

a. $\frac{1}{2} \times 60 = \frac{1 \times 2 \times 30}{2} = 30$ ← or → $\frac{1}{2} \times 60 = \frac{1 \times \cancel{60}^{30}}{2} = 30$

$\frac{1}{2}$ minute = 30 seconds

b. $\frac{3}{4} \times 60 = \frac{3 \times 4 \times 15}{4} = 3 \times 15 = 45$ ← or → $\frac{3}{4} \times 60 = \frac{3 \times \cancel{60}^{15}}{4} = 45$

$\frac{3}{4}$ hour = 45 minutes

c. $\frac{3}{10} \times 1,000 = \frac{3 \times 10 \times 100}{10} = \frac{3 \times 100}{1} = 300$ ← or → $\frac{3}{10} \times 1,000 = \frac{3 \times \cancel{1,000}^{100}}{10} = 300$

$\frac{3}{10}$ kilogram = 300 grams

d. $\frac{4}{5} \times 100 = \frac{4 \times 5 \times 20}{5} = \frac{4 \times 20}{1} = 80$ ← or → $\frac{4}{5} \times 100 = \frac{4 \times \cancel{100}^{20}}{5} = 80$

$\frac{4}{5}$ meter = 80 centimeters

Name _____

Date _____

1. Rewrite the following expressions as shown in the example.

Example: $\frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3} = \frac{4 \times 2}{3} = \frac{8}{3}$

a. $\frac{5}{3} + \frac{5}{3} + \frac{5}{3} =$

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

b. $\frac{13}{5} + \frac{13}{5}$

$$\frac{2 \times 13}{5} = \frac{26}{5} = 5\frac{1}{5}$$

c. $\frac{9}{4} + \frac{9}{4} + \frac{9}{4}$

$$\frac{3 \times 9}{4} = \frac{27}{4} = 6\frac{3}{4}$$

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

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

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

a. $\frac{3}{4} \times 16 =$

$$\frac{3 \times 16}{4} = \frac{48}{4} = 12$$

$$\frac{3}{4} \times 16 =$$

$$\frac{3 \times 16^4}{4^4} = \frac{3 \times 4}{1} = 12$$

b. $\frac{4}{3} \times 12 =$

$$\frac{4 \times 12}{3} = \frac{48}{3} = 16$$

$$\frac{4}{3} \times 12 =$$

$$\frac{4 \times 12^4}{3^4} = \frac{16}{1} = 16$$

c. $40 \times \frac{11}{10}$

$$\frac{40 \times 11}{10} = \frac{440}{10} = \frac{44}{1} = 44$$

$$40 \times \frac{11}{10}$$

$$\frac{440 \times 11}{10^4} = \frac{4 \times 11}{1} = \frac{44}{1} = 44$$

d. $\frac{7}{6} \times 36 =$

$$\frac{7 \times 36}{6} = \frac{252}{6} = \frac{42}{1} = 42$$

$$\frac{7}{6} \times 36 =$$

$$\frac{7 \times 36^6}{6^6} = \frac{42}{1} = 42$$

e. $24 \times \frac{5}{8}$

$$\frac{24 \times 5}{8} = \frac{120}{8} = \frac{15}{1} = 15$$

$$24 \times \frac{5}{8}$$

$$\frac{324 \times 5}{8^4} = \frac{3 \times 5}{1} = \frac{15}{1} = 15$$

f. $18 \times \frac{5}{12}$

$$\frac{18 \times 5}{12} = \frac{90}{12} = 7\frac{6}{12} = 7\frac{1}{2}$$

$18 \times \frac{5}{12}$

$$\frac{3 \cancel{18} \times 5}{\cancel{12}_2} = \frac{15}{2} = 7\frac{1}{2}$$

g. $\frac{10}{9} \times 21$

$$\frac{10 \times 21}{9} = \frac{210}{9} = 23\frac{3}{9} = 23\frac{1}{3}$$

$\frac{10}{9} \times 21$

$$\frac{10 \times 21 \cancel{7}}{9 \cancel{3}} = \frac{70}{3} = 23\frac{1}{3}$$

3. Solve each problem any way you choose.

a. $\frac{1}{3} \times 60$

$$\frac{1 \times 60}{3} = \frac{60}{3} = 20 \quad \leftarrow \text{or} \rightarrow \quad \frac{1 \times \cancel{60}^{20}}{\cancel{3}_1} = 20$$

$\frac{1}{3}$ minute = 20 seconds

b. $\frac{4}{5} \times 60$

$$\frac{4 \times 60}{5} = \frac{240}{5} = 48 \quad \leftarrow \text{or} \rightarrow \quad \frac{4 \times \cancel{60}^{12}}{\cancel{5}_1} = \frac{48}{1} = 48$$

$\frac{4}{5}$ hour = 48 minutes

c. $\frac{7}{10} \times 1000$

$$\frac{7 \times 1000}{10} = \frac{7000}{10} = 700 \quad \leftarrow \text{or} \rightarrow \quad \frac{7 \times \cancel{1000}^{\cancel{10}}}{\cancel{10}_1} = 700$$

$\frac{7}{10}$ kilogram = 700 grams

d. $\frac{3}{5} \times 100$

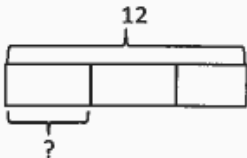
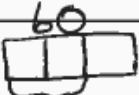
$$\frac{3 \times 100}{5} = \frac{300}{5} = 60 \quad \leftarrow \text{or} \rightarrow \quad \frac{3 \times \cancel{100}^{20}}{\cancel{5}_1} = \frac{60}{1} = 60$$

$\frac{3}{5}$ meter = 60 centimeters

Name _____

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1. Convert. Show your work using a tape diagram or an equation. The first one is done for you.

<p>a. $\frac{1}{2}$ yard = $1\frac{1}{2}$ feet</p> <p>$\frac{1}{2}$ yard = $\frac{1}{2} \times 1$ yard</p> <p style="padding-left: 20px;">$= \frac{1}{2} \times 3$ feet</p> <p style="padding-left: 20px;">$= \frac{3}{2}$ feet</p> <p style="padding-left: 20px;">$= 1\frac{1}{2}$ feet</p>	<p>b. $\frac{1}{3}$ foot = <u>4</u> inches</p> <p>$\frac{1}{3}$ foot = $\frac{1}{3} \times 1$ foot</p> <p style="padding-left: 20px;">$= \frac{1}{3} \times 12$ inches</p> <p style="padding-left: 20px;">$= \frac{12}{3} =$</p> <p style="padding-left: 20px;">4 inches</p> 
<p>c. $\frac{5}{6}$ year = <u>10</u> months</p> <p>$\frac{5}{6}$ year = $\frac{5}{6} \times 1$ year</p> <p style="padding-left: 20px;">$= \frac{5}{6} \times 12$ months</p> <p style="padding-left: 20px;">$= \frac{60}{6}$ months</p> <p style="padding-left: 20px;">$= 10$ months</p>	<p>d. $\frac{4}{5}$ meter = <u>80</u> centimeters</p> <p>$\frac{4}{5}$ meter = $\frac{4}{5} \times 1$ meter</p> <p style="padding-left: 20px;">$= \frac{4}{5} \times 100$ cm</p> <p style="padding-left: 20px;">$= \frac{400}{5}$ cm</p> <p style="padding-left: 20px;">$= 80$ cm</p>
<p>e. $\frac{2}{3}$ hour = _____ minutes</p>  <p>$\frac{2}{3}$ hour $\times 1$ hour</p> <p style="padding-left: 20px;">$= \frac{2}{3} \times 60$ min.</p> <p style="padding-left: 20px;">$= \frac{120}{3}$ min.</p> <p style="padding-left: 20px;">$= 40$ min.</p> <p style="padding-left: 20px;">3 units = 60 1 unit = $\frac{60}{3}$ = 20 2 units = 2 x 20 = 40</p>	<p>f. $\frac{3}{4}$ yard = <u>27</u> inches</p> <p>$\frac{3}{4}$ yard = $\frac{3}{4} \times 1$ yard</p> <p style="padding-left: 20px;">$= \frac{3}{4} \times 36$ inches</p> <p style="padding-left: 20px;">$= \frac{108}{4}$ inches</p> <p style="padding-left: 20px;">$= 27$ inches</p>

2. Mrs. Lang told her class that the class's pet hamster is $\frac{1}{4}$ ft in length. How long is the hamster in inches?

$$\begin{aligned} \frac{1}{4} \text{ ft} &= \frac{1}{4} \times 1 \text{ ft} \\ &= \frac{1}{4} \times 12 \text{ inches} \\ &= \frac{12}{4} = 3 \text{ inches} \end{aligned}$$

The hamster is 3 inches long.

3. At the market, Mr. Paul bought $\frac{7}{8}$ lb of cashews and $\frac{3}{4}$ lb of walnuts.

- a. How many ounces of cashews did Mr. Paul buy?

$$\begin{aligned} \frac{7}{8} \text{ lb} &= \frac{7}{8} \times 1 \text{ lb} \\ &= \frac{7}{8} \times 16 \text{ ounces} \\ &= \frac{112}{8} = 14 \text{ ounces} \end{aligned}$$

Mr. Paul bought 14 ounces of cashews.

- b. How many ounces of walnuts did Mr. Paul buy?

$$\begin{aligned} \frac{3}{4} \text{ lb} &= \frac{3}{4} \times 1 \text{ lb} \\ &= \frac{3}{4} \times 16 \text{ ounces} \\ &= \frac{48}{4} = 12 \text{ ounces} \end{aligned}$$

Mr. Paul bought 12 ounces of walnuts.

- c. How many more ounces of cashews than walnuts did Mr. Paul buy?

$$\begin{array}{r} 14 \text{ oz} \\ -12 \text{ oz} \\ \hline 2 \text{ oz} \end{array}$$

Mr. Paul bought 2 ounces more cashews than walnuts.

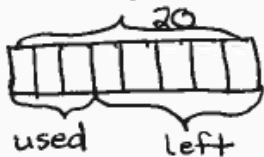
- d. If Mrs. Toombs bought $1\frac{1}{2}$ pounds of pistachios, who bought more nuts, Mr. Paul or Mrs. Toombs? How many ounces more?

$$\begin{aligned} 1\frac{1}{2} \text{ lb} &= 1\frac{1}{2} \times 1 \text{ lb} \\ &= 1\frac{1}{2} \times 16 \text{ ounces} \\ &= \frac{3}{2} \times 16 \text{ ounces} = \frac{48}{2} = 24 \text{ ounces} \end{aligned}$$

Mr. Paul bought 26 oz
Mrs. Toombs bought 24 oz

Mr. Paul bought more by 2 ounces.

4. A jewelry maker purchased 20 inches of gold chain. She used $\frac{3}{8}$ of the chain for a bracelet. How many inches of gold chain did she have left?



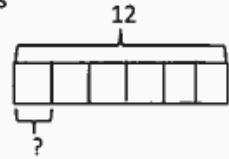
$$\begin{aligned} 8 \text{ units} &= 20 \\ 1 \text{ unit} &= \frac{20}{8} = 2\frac{4}{8} = 2\frac{1}{2} \\ 5 \text{ units} &= 2\frac{1}{2} + 2\frac{1}{2} + 2\frac{1}{2} + 2\frac{1}{2} + 2\frac{1}{2} = 10\frac{5}{2} = 10 + 2 + \frac{1}{2} = 12\frac{1}{2} \end{aligned}$$

12 $\frac{1}{2}$ inches left

Name _____

Date _____

1. Convert. Show your work using a tape diagram or an equation. The first one is done for you.

<p>a. $\frac{1}{4}$ yard = <u>9</u> inches</p> $\frac{1}{4} \text{ yard} = \frac{1}{4} \times 1 \text{ yard}$ $= \frac{1}{4} \times 36 \text{ inches}$ $= \frac{36}{4} \text{ inches}$ $= 9 \text{ inches}$	<p>b. $\frac{1}{6}$ foot = <u>2</u> inches</p> $\frac{1}{6} \text{ foot} = \frac{1}{6} \times 1 \text{ foot}$ $= \frac{1}{6} \times 12 \text{ inches}$ $= \frac{12}{6} = 2 \text{ in}$ 
<p>c. $\frac{3}{4}$ year = <u>9</u> months</p> $\frac{3}{4} \text{ yr} = \frac{3}{4} \times 1 \text{ yr}$ $= \frac{3}{4} \times 12 \text{ months}$ $= \frac{36}{4} = 9 \text{ months}$	<p>d. $\frac{3}{5}$ meter = <u>60</u> centimeters</p> $\frac{3}{5} \text{ m} = \frac{3}{5} \times 1 \text{ m}$ $= \frac{3}{5} \times 100 \text{ cm}$ $= \frac{300}{5} \text{ cm}$ $= 60 \text{ cm}$
<p>e. $\frac{5}{12}$ hour = <u>25</u> minutes</p> $\frac{5}{12} \text{ hr} = \frac{5}{12} \times 1 \text{ hr}$ $= \frac{5}{12} \times 60 \text{ min}$ $= \frac{300}{12} = 25 \text{ min.}$ <div style="margin-left: 200px;"> $\begin{array}{r} 25 \\ 12 \overline{)300} \\ \underline{-24} \\ 60 \\ \underline{-60} \\ 0 \end{array}$ </div>	<p>f. $\frac{2}{3}$ yard = <u>24</u> inches</p> $\frac{2}{3} \text{ yd} = \frac{2}{3} \times 1 \text{ yd}$ $= \frac{2}{3} \times 36 \text{ inches}$ $= \frac{72}{3} \text{ inches}$ $= 24 \text{ inches}$ <div style="margin-left: 200px;"> $\begin{array}{r} 36 \\ \times 2 \\ \hline 72 \end{array}$ $\begin{array}{r} 24 \\ 3 \overline{)72} \\ \underline{-6} \\ 12 \\ \underline{-12} \\ 0 \end{array}$ </div>

2. Michelle measured the length of her forearm. It was $\frac{3}{4}$ of a foot. How long is her forearm in inches?

$$\frac{3}{4} \text{ ft} = \text{--- inches}$$

$$\frac{3}{4} \times 1 \text{ ft}$$

$$= \frac{3}{4} \times 12 \text{ inches} = \frac{36}{4} = 9 \text{ inches}$$

3. At the market, Ms. Winn bought $\frac{3}{4}$ lb of grapes and $\frac{5}{8}$ lb of cherries.

a. How many ounces of grapes did Ms. Winn buy?

$$\frac{3}{4} \text{ lb} = \underline{\hspace{1cm}} \text{ oz}$$

$$\frac{3}{4} \times 16 \text{ oz} =$$

b. $\frac{48}{4} = 12$ ounces of grapes
 How many ounces of cherries did Ms. Winn buy?

$$\frac{5}{8} \text{ lb} = \underline{\hspace{1cm}} \text{ oz} \quad \frac{5}{8} \times 16 \text{ oz} =$$

$$\frac{80}{8} \text{ oz} = 10 \text{ ounces of cherries}$$

$$\begin{array}{r} 36 \\ \times 5 \\ \hline 80 \end{array}$$

c. How many more ounces of grapes than cherries did Ms. Winn buy?

$$\begin{array}{r} 12 \text{ oz} \\ -10 \text{ oz} \\ \hline 2 \text{ oz} \end{array}$$

Ms. Winn bought 2 oz more grapes than cherries.

d. If Mr. Phillips bought $1\frac{3}{4}$ pounds of raspberries, who bought more fruit, Ms. Winn or Mr. Phillips?
 How many ounces more?

$$1\frac{3}{4} \text{ lb} = \underline{\hspace{1cm}} \text{ oz}$$

$$\frac{7}{4} \times 16 \text{ oz} =$$

$$\frac{112}{4} \text{ oz} = 28 \text{ ounces of raspberries.}$$

$$\begin{array}{r} 28 \text{ oz Mr. Phillips} \\ -22 \text{ oz Ms. Winn} \\ \hline 6 \text{ oz} \end{array}$$

$$\begin{array}{r} 416 \\ \times 7 \\ \hline 112 \end{array} \quad \begin{array}{r} 28 \\ 4 \overline{)112} \\ \underline{-8} \\ 32 \\ \underline{-32} \\ 0 \end{array}$$

Mr. Phillips bought 6 oz more

4. A gardener has 10 pounds of soil. He used $\frac{5}{8}$ of the soil for his garden. How many pounds of soil did he use in the garden? How many pounds did he have left?

$$\frac{5}{8} \times 10 = \frac{50}{8} = 6\frac{2}{8} = 6\frac{1}{4} \text{ lb used in his garden}$$

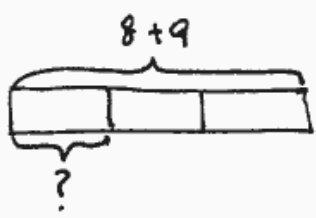
$$\begin{array}{r} 10 = 9\frac{4}{4} \\ - 6\frac{1}{4} \\ \hline 3\frac{3}{4} \end{array}$$

$3\frac{3}{4}$ lb of soil left.

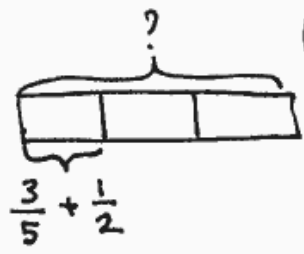
Name _____

Date _____

1. Write expressions to match the diagrams. Then, evaluate.



$$\begin{aligned} \frac{1}{3} \times (8+9) \\ &= \frac{1}{3} \times 17 \\ &= \frac{17}{3} = 5\frac{2}{3} \end{aligned}$$



$$\begin{aligned} \left(\frac{3}{5} + \frac{1}{2}\right) \times 3 \\ \frac{3}{5} \times \frac{2}{2} = \frac{6}{10} \\ \frac{1}{2} \times \frac{5}{5} = \frac{5}{10} \\ \frac{11}{10} \times 3 = \frac{33}{10} \\ 3\frac{3}{10} \end{aligned}$$

2. Write an expression to match, and then evaluate.

- a. $\frac{1}{6}$ the sum of 16 and 20

$$\begin{aligned} \frac{1}{6} \times (16+20) \\ &= \frac{1}{6} \times 36 = \frac{36}{6} \\ &= 6 \end{aligned}$$

- b. Subtract 5 from $\frac{1}{3}$ of 23.

$$\begin{aligned} \left(\frac{1}{3} \times 23\right) - 5 = \\ \frac{23}{3} - 5 = 7\frac{2}{3} - 5 = 2\frac{2}{3} \end{aligned}$$

- c. 3 times as much as the sum of $\frac{3}{4}$ and $\frac{2}{6}$

$$\begin{aligned} 3 \times \left(\frac{3}{4} + \frac{2}{6}\right) &= \frac{3}{4} \times \frac{3}{3} = \frac{9}{12} \\ \frac{2}{6} \times \frac{2}{2} &= \frac{4}{12} \end{aligned}$$

$$3 \times \frac{13}{12} = \frac{39}{12} = 3\frac{3}{12} = 3\frac{1}{4}$$

- d. $\frac{2}{5}$ of the product of $\frac{5}{6}$ and 42

$$\begin{aligned} \left(\frac{5}{6} \times 42\right) \times \frac{2}{5} = \\ \frac{5 \times 42 \times 2}{6 \times 5} = \frac{7 \times 2}{1} = 14 \end{aligned}$$

- e. 8 copies of the sum of 4 thirds and 2 more

$$\begin{aligned} \left(\frac{4}{3} + 2\right) \times 8 &= 1\frac{1}{3} + 2 = 3\frac{1}{3} \times 8 \\ &= \frac{10}{3} \times 8 = \frac{80}{3} = 26\frac{2}{3} \end{aligned}$$

- f. 4 times as much as 1 third of 8

$$\left(\frac{1}{3} \times 8\right) \times 4 = \frac{8}{3} \times 4 = \frac{32}{3} = 10\frac{2}{3}$$

3. Circle the expression(s) that give the same product as $\frac{4}{5} \times 7$. Explain how you know.

$4 \div (7 \times 5)$ $7 \div 5 \times 4$ $(4 \times 7) \div 5$ $4 \div (5 \times 7)$ $4 \times \frac{7}{5}$ $7 \times \frac{4}{5}$
 $\frac{4 \times 7}{5} = \frac{28}{5}$ $4 \times \frac{7}{5} = \frac{4}{1} \times \frac{7}{5} = \frac{28}{5}$ $7 \times \frac{4}{5} = \frac{7}{1} \times \frac{4}{5} = \frac{28}{5}$

They all have the same product

4. Use $<$, $>$, or $=$ to make true number sentences without calculating. Explain your thinking.

a. $4 \times 2 + 4 \times \frac{2}{3}$ $>$ $3 \times \frac{2}{3}$ $4 \times \frac{2}{3}$ is more than $3 \times \frac{2}{3}$ even before adding 4×2 .

b. $(5 \times \frac{3}{4}) \times \frac{2}{5}$ $>$ $(5 \times \frac{3}{4}) \times \frac{2}{7}$ $\frac{2}{5}$ of a number is larger than $\frac{2}{7}$ of a number

c. $3 \times (3 + \frac{15}{12})$ $>$ $(3 \times 3) + \frac{15}{12}$ $3 \times \frac{15}{12}$ is more than $3 + \frac{15}{12}$,

5. Collette bought milk for herself each month and recorded the amount in the table below. For (a)–(c), write an expression that records the calculation described. Then, solve to find the missing data in the table.

a. She bought $\frac{1}{4}$ of July's total in June.

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

b. She bought $\frac{3}{4}$ as much in September as she did in January and July combined.

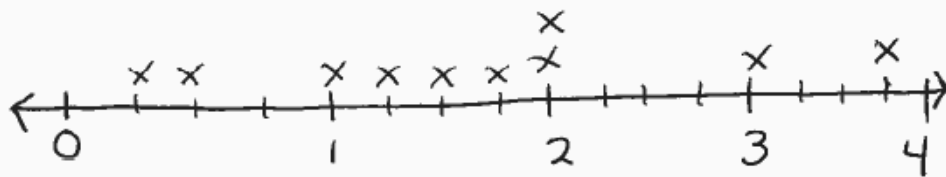
$$\frac{3}{4} \times (3+2) = \frac{3}{4} \times 5 = \frac{15}{4} = 3\frac{3}{4}$$

c. In April, she bought $\frac{1}{2}$ gallon less than twice as much as she bought in August.

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

Month	Amount (in gallons)
January	3
February	2
March	$1\frac{1}{4}$
April	$1\frac{1}{2} = 1\frac{2}{4}$
May	$\frac{7}{4} = 1\frac{3}{4}$
June	$\frac{1}{2} = \frac{2}{4}$
July	2
August	1
September	$3\frac{3}{4}$
October	$\frac{1}{4}$

d. Display the data from the table in a line plot.



e. How many gallons of milk did Collette buy from January to October?

$$3 + 2 + 1\frac{1}{4} + 1\frac{1}{2} + \frac{7}{4} + \frac{1}{2} + 2 + 1 + 3\frac{3}{4} + \frac{1}{4}$$

$$= 1\frac{2}{4} + 1\frac{3}{4} = \frac{3}{4}$$

$$3 + 2 + 1\frac{1}{4} + 1\frac{2}{4} + 1\frac{3}{4} + \frac{2}{4} + 2 + 1 + 3\frac{3}{4} + \frac{1}{4} = 14\frac{12}{4} = 14 + 3 = 17 \text{ gallons}$$

Name _____

Date _____

1. Write expressions to match the diagrams. Then, evaluate.

$$\frac{1}{4} \times (17 + 4) = \frac{1}{4} \times \frac{21}{4} = 5\frac{1}{4}$$

$$2 \text{ units} = \frac{68}{21}$$

$$4 \text{ units} = \frac{136}{21} = 6\frac{10}{21}$$

$$\left(\frac{4}{7} + \frac{8}{3}\right) = \frac{4 \cdot 3}{7 \cdot 3} + \frac{8 \cdot 7}{3 \cdot 7} = \frac{12}{21} + \frac{56}{21} = \frac{68}{21}$$

2. Circle the expression(s) that give the same product as $6 \times \frac{3}{8}$. Explain how you know.

$8 \div (3 \times 6)$

$3 \div 8 \times 6$

$(6 \times 3) \div 8$ (circled)

$(8 \div 6) \times 3$

$6 \times \frac{8}{3}$

$\frac{3}{8} \times 6$ (circled)

$\frac{18}{8} = 2\frac{2}{8}$

$\frac{3}{8} \times 6 = \frac{3 \times 6}{8} = \frac{18}{8} = 2\frac{2}{8}$

3. Write an expression to match, and then evaluate.

- a. $\frac{1}{8}$ the sum of 23 and 17

$\frac{1}{8} \times (23 + 17) = \frac{1}{8} \times 40 = \frac{40}{8} = 5$

- b. Subtract 4 from $\frac{1}{6}$ of 42.

$\left(\frac{1}{6} \times 42\right) - 4 = \frac{42}{6} - 4 = 7 - 4 = 3$

- c. 7 times as much as the sum of $\frac{1}{3}$ and $\frac{4}{5}$

$7 \times \left(\frac{1}{3} + \frac{4}{5}\right) = 7 \times \frac{17}{15} = \frac{119}{15} = 7\frac{14}{15}$

- d. $\frac{2}{3}$ of the product of $\frac{3}{8}$ and 16

$\frac{2}{3} \times \left(\frac{3}{8} \times 16\right) = \frac{2}{3} \times \frac{48}{8} = \frac{2}{3} \times 6 = \frac{12}{3} = 4$

- e. 7 copies of the sum of 8 fifths and 4

$7 \times \left(\frac{8}{5} + 4\right) = 7 \times 4\frac{8}{5} = 7 \times \frac{28}{5} = \frac{196}{5}$

- f. 15 times as much as 1 fifth of 12

$15 \times \left(\frac{1}{5} \times 12\right) = 15 \times \frac{12}{5} = \frac{180}{5} = 36$

$\frac{196}{5} = 39\frac{1}{5}$

4. Use $<$, $>$, or $=$ to make true number sentences without calculating. Explain your thinking.

a. $\frac{2}{3} \times (9 + 12)$ $>$ $15 \times \frac{2}{3}$
 $\frac{2}{3} \times \frac{21}{1} = \frac{42}{3}$ $\frac{15 \times 2}{1 \times 3} = \frac{30}{3}$

b. $(3 \times \frac{5}{4}) \times \frac{3}{5}$ $>$ $(3 \times \frac{5}{4}) \times \frac{3}{8}$
 $\frac{15}{4} \times \frac{3}{5} = \frac{45}{20} = 2\frac{5}{20} = 2\frac{1}{4}$ $\frac{15}{4} \times \frac{3}{8} = \frac{45}{32} = 1\frac{13}{32}$

b. $6 \times (2 + \frac{32}{16})$ $>$ $(6 \times 2) + \frac{32}{16}$
 $6 \times 2\frac{32}{16} = 12 + \frac{32}{16} = 12\frac{32}{16}$
 $6 \times \frac{64}{16}$

5. Fantine bought flour for her bakery each month and recorded the amount in the table to the right. For (a)–(c), write an expression that records the calculation described. Then, solve to find the missing data in the table.

Month	Amount (in pounds)
January	3
February	2
March	$1\frac{1}{4}$
April	$1\frac{3}{4}$
May	$\frac{9}{8} = 1\frac{1}{8}$
June	$3\frac{1}{4}$
July	$1\frac{1}{4}$
August	$2\frac{1}{4}$
September	$\frac{11}{4} = 2\frac{3}{4}$
October	$\frac{3}{4}$

a. She bought $\frac{3}{4}$ of January's total in August.

$\frac{3}{4} \times 3 = \frac{9}{4} = 2\frac{1}{4}$ August

b. She bought $\frac{7}{8}$ as much in April as she did in October and July combined.

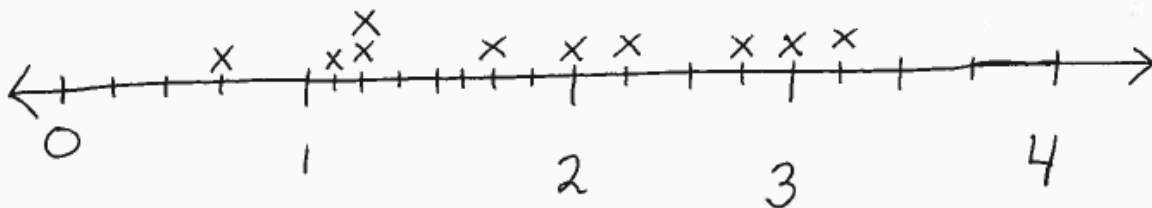
$\frac{7}{8} \times (\frac{3}{4} + \frac{1}{4}) = \frac{7}{8} \times 2 = \frac{7 \times 2}{8 \times 1} = \frac{14}{8} = \frac{7}{4} = 1\frac{3}{4}$ April

$= 1\frac{2}{8}$
 $= 1\frac{6}{8}$
 $= 3\frac{2}{8}$
 $= 1\frac{2}{8}$
 $= 2\frac{2}{8}$
 $= 2\frac{6}{8}$
 $= \frac{6}{8}$

- c. In June, she bought $\frac{1}{8}$ pound less than three times as much as she bought in May.

$$\begin{aligned} & \left(3 \times \frac{9}{8}\right) - \frac{1}{8} = \\ & \frac{3 \times 9}{8} - \frac{1}{8} = \frac{27}{8} = 3 \frac{3}{8} = 3 \frac{1}{4} \end{aligned}$$

- d. Display the data from the table in a line plot.



- e. How many pounds of flour did Fantine buy from January to October?

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

$$\begin{aligned} & 16 + \frac{1}{4} \times \frac{2}{2} = 16 \frac{2}{8} \\ & \frac{3}{4} \times \frac{2}{2} = \frac{6}{8} \\ & \frac{1}{8} \rightarrow \frac{1}{8} \\ & \frac{1}{4} \times \frac{2}{2} = \frac{2}{8} \\ & \frac{1}{4} \times \frac{2}{2} = \frac{2}{8} \\ & \frac{1}{4} \times \frac{2}{2} = \frac{2}{8} \\ & \frac{3}{4} \times \frac{2}{2} = \frac{6}{8} \\ & \frac{3}{4} \times \frac{2}{2} = \frac{6}{8} \end{aligned} \left. \begin{array}{l} \\ \\ \\ \\ \\ \\ \\ \end{array} \right\} \begin{array}{l} 16 \frac{8}{8} = 17 \\ \\ \frac{7}{8} \\ \\ \\ \frac{12}{8} \end{array}$$

$$\begin{array}{r} 17 \frac{7}{8} \\ + \frac{12}{8} \\ \hline 17 \frac{19}{8} = 17 + 2 \frac{3}{8} = 19 \frac{3}{8} \end{array}$$