

A Story of Units

Pleasanton
UNIFIED SCHOOL DISTRICT

Mathematics Curriculum



Grade 5 • MODULE 3

Addition and Subtraction of Fractions

Homework

Video tutorials: <http://embarc.online>

Info for parents: <http://bit.ly/pusdmath>

Version 3



Table of Contents

GRADE 5 • MODULE 3

Addition and Subtraction of Fractions

Module Overview	2
Topic A: Equivalent Fractions	10
Topic B: Making Like Units Pictorially	40
Mid-Module Assessment and Rubric	119
Topic C: Making Like Units Numerically	126
Topic D: Further Applications	204
End-of-Module Assessment and Rubric	260
Answer Key	267

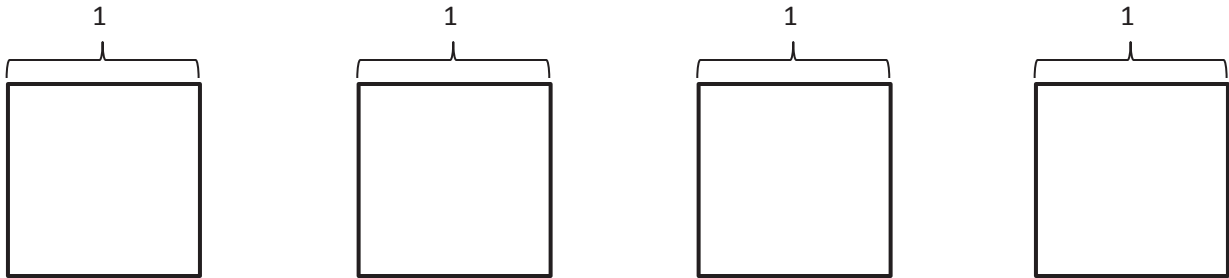
Name _____

Date _____

1. Use the folded paper strip to mark points 0 and 1 above the number line and $\frac{0}{3}$, $\frac{1}{3}$, $\frac{2}{3}$, and $\frac{3}{3}$ below it.

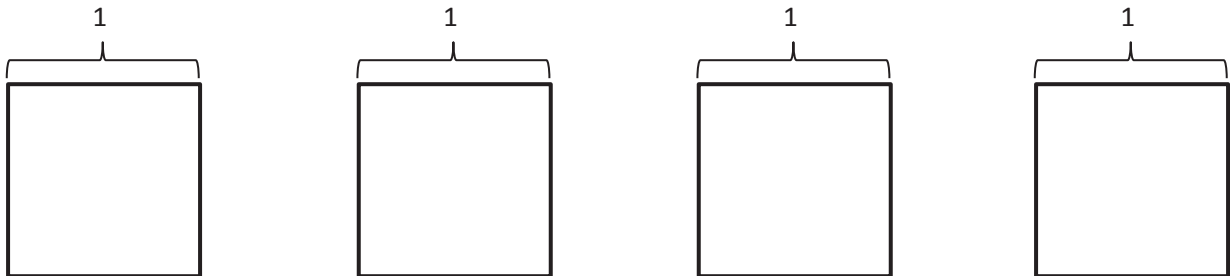


Draw two vertical lines to break each rectangle into thirds. Shade the left third of each. Partition with horizontal lines to show equivalent fractions. Use multiplication to show the change in the units.

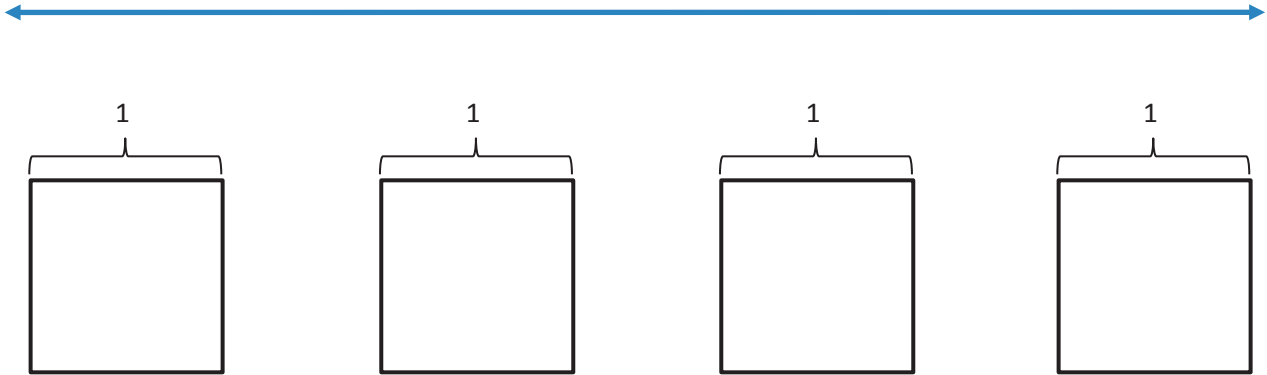


$$\frac{1}{3} = \frac{1 \times 2}{3 \times 2} = \frac{2}{6}$$

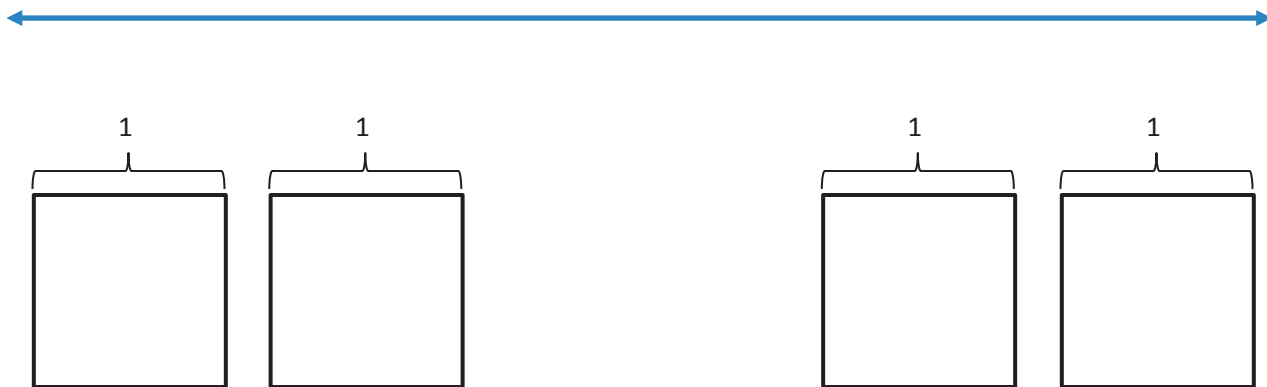
2. Use the folded paper strip to mark points 0 and 1 above the number line and $\frac{0}{4}$, $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, and $\frac{4}{4}$ below it. Follow the same pattern as Problem 1 but with fourths.



3. Continue the pattern with 4 fifths.



4. Continue the process, and model 2 equivalent fractions for 9 eighths. Estimate to mark the points on the number line.



Name _____

Date _____

1. Show each expression on a number line. Solve.

a. $\frac{4}{9} + \frac{1}{9}$

b. $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$

c. $\frac{2}{7} + \frac{2}{7} + \frac{2}{7}$

d. $2 \times \frac{3}{5} + \frac{1}{5}$

2. Express each fraction as the sum of two or three equal fractional parts. Rewrite each as a multiplication equation. Show Part (a) on a number line.

a. $\frac{6}{11}$

b. $\frac{9}{4}$

c. $\frac{12}{8}$

d. $\frac{27}{10}$

3. Express each of the following as the sum of a whole number and a fraction. Show Parts (c) and (d) on number lines.

a. $\frac{9}{5}$

b. $\frac{7}{2}$

c. $\frac{25}{7}$

d. $\frac{21}{9}$

4. Natalie sawed five boards of equal length to make a stool. Each was $\frac{9}{10}$ of a meter long. What is the total length of the boards she sawed? Express your answer as the sum of a whole number and the remaining fractional units. Draw a number line to represent the problem.

Name _____

Date _____

1. Draw a rectangular fraction model to find the sum. Simplify your answer, if possible.

a. $\frac{1}{4} + \frac{1}{3} =$

b. $\frac{1}{4} + \frac{1}{5} =$

c. $\frac{1}{4} + \frac{1}{6} =$

d. $\frac{1}{5} + \frac{1}{9} =$

e. $\frac{1}{4} + \frac{2}{5} =$

f. $\frac{3}{5} + \frac{3}{7} =$

Solve the following problems. Draw a picture, and write the number sentence that proves the answer. Simplify your answer, if possible.

2. Rajesh jogged $\frac{3}{4}$ mile and then walked $\frac{1}{6}$ mile to cool down. How far did he travel?

3. Cynthia completed $\frac{2}{3}$ of the items on her to-do list in the morning and finished $\frac{1}{8}$ of the items during her lunch break. What fraction of her to-do list is finished by the end of her lunch break?
(Extension: What fraction of her to-do list does she still have to do after lunch?)

4. Sam read $\frac{2}{5}$ of her book over the weekend and $\frac{1}{6}$ of it on Monday. What fraction of the book has she read? What fraction of the book is left?

Name _____

Date _____

1. For the following problems, draw a picture using the rectangular fraction model and write the answer. When possible, write your answer as a mixed number.

a. $\frac{3}{4} + \frac{1}{3} =$

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

c. $\frac{1}{3} + \frac{3}{5} =$

d. $\frac{5}{6} + \frac{1}{2} =$

e. $\frac{2}{3} + \frac{5}{6} =$

f. $\frac{4}{3} + \frac{4}{7} =$

Solve the following problems. Draw a picture, and write the number sentence that proves the answer. Simplify your answer, if possible.

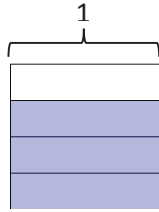
2. Sam made $\frac{2}{3}$ liter of punch and $\frac{3}{4}$ liter of tea to take to a party. How many liters of beverages did Sam bring to the party?

3. Mr. Sinofsky used $\frac{5}{8}$ of a tank of gas on a trip to visit relatives for the weekend and another 1 half of a tank commuting to work the next week. He then took another weekend trip and used $\frac{1}{4}$ tank of gas. How many tanks of gas did Mr. Sinofsky use altogether?

Name _____

Date _____

1. The picture below shows $\frac{3}{4}$ of the rectangle shaded. Use the picture to show how to create an equivalent fraction for $\frac{3}{4}$, and then subtract $\frac{1}{3}$.



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

2. Find the difference. Use a rectangular fraction model to find common denominators. Simplify your answer, if possible.

a. $\frac{5}{6} - \frac{1}{3} =$

b. $\frac{2}{3} - \frac{1}{2} =$

c. $\frac{5}{6} - \frac{1}{4} =$

d. $\frac{4}{5} - \frac{1}{2} =$

e. $\frac{2}{3} - \frac{2}{5} =$

f. $\frac{5}{7} - \frac{2}{3} =$

3. Robin used $\frac{1}{4}$ of a pound of butter to make a cake. Before she started, she had $\frac{7}{8}$ of a pound of butter. How much butter did Robin have when she was done baking? Give your answer as a fraction of a pound.

4. Katrina needs $\frac{3}{5}$ kilogram of flour for a recipe. Her mother has $\frac{3}{7}$ kilogram of flour in her pantry. Is this enough flour for the recipe? If not, how much more will she need?

Name _____ Date _____

1. For the following problems, draw a picture using the rectangular fraction model and write the answer. Simplify your answer, if possible.

a. $1 - \frac{5}{6} =$

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

c. $\frac{4}{3} - \frac{5}{7} =$

d. $1\frac{1}{8} - \frac{3}{5} =$

e. $1\frac{2}{5} - \frac{3}{4} =$

f. $1\frac{5}{6} - \frac{7}{8} =$

g. $\frac{9}{7} - \frac{3}{4} =$

h. $1\frac{3}{12} - \frac{2}{3} =$

2. Sam had $1\frac{1}{2}$ m of rope. He cut off $\frac{5}{8}$ m and used it for a project. How much rope does Sam have left?

3. Jackson had $1\frac{3}{8}$ kg of fertilizer. He used some to fertilize a flower bed, and he only had $\frac{2}{3}$ kg left. How much fertilizer was used in the flower bed?

Name _____

Date _____

Solve the word problems using the RDW strategy. Show all of your work.

1. Christine baked a pumpkin pie. She ate $\frac{1}{6}$ of the pie. Her brother ate $\frac{1}{3}$ of it and gave the leftovers to his friends. What fraction of the pie did he give to his friends?

2. Liang went to the bookstore. He spent $\frac{1}{3}$ of his money on a pen and $\frac{4}{7}$ of it on books. What fraction of his money did he have left?

3. Tiffany bought $\frac{2}{5}$ kg of cherries. Linda bought $\frac{1}{10}$ kg of cherries less than Tiffany. How many kilograms of cherries did they buy altogether?
4. Mr. Rivas bought a can of paint. He used $\frac{3}{8}$ of it to paint a bookshelf. He used $\frac{1}{4}$ of it to paint a wagon. He used some of it to paint a birdhouse and has $\frac{1}{8}$ of the paint left. How much paint did he use for the birdhouse?

5. Ribbon A is $\frac{1}{3}$ m long. It is $\frac{2}{5}$ m shorter than Ribbon B. What's the total length of the two ribbons?

Name _____

Date _____

1. Add or subtract.

a. $3 + 1\frac{1}{4} =$

b. $2 - 1\frac{5}{8} =$

c. $5\frac{2}{5} + 2\frac{3}{5} =$

d. $4 - 2\frac{5}{7} =$

e. $8\frac{4}{5} + 7 =$

f. $18 - 15\frac{3}{4} =$

g. $16 + 18\frac{5}{6} =$

h. $100 - 50\frac{3}{8} =$

2. The total length of two ribbons is 13 meters. If one ribbon is $7\frac{5}{8}$ meters long, what is the length of the other ribbon?
3. It took Sandy two hours to jog 13 miles. She ran $7\frac{1}{2}$ miles in the first hour. How far did she run during the second hour?

4. Andre says that $5\frac{3}{4} + 2\frac{1}{4} = 7\frac{1}{2}$ because $7\frac{4}{8} = 7\frac{1}{2}$. Identify his mistake. Draw a picture to prove that he is wrong.

Name _____

Date _____

1. Make like units, and then add.

a. $\frac{3}{5} + \frac{1}{3} =$

b. $\frac{3}{5} + \frac{1}{11} =$

c. $\frac{2}{9} + \frac{5}{6} =$

d. $\frac{2}{5} + \frac{1}{4} + \frac{1}{10} =$

e. $\frac{1}{3} + \frac{7}{5} =$

f. $\frac{5}{8} + \frac{7}{12} =$

g. $1\frac{1}{3} + \frac{3}{4} =$

h. $\frac{5}{6} + 1\frac{1}{4} =$

2. On Monday, Ka practiced guitar for $\frac{2}{3}$ of one hour. When she finished, she practiced piano for $\frac{3}{4}$ of one hour. How much time did Ka spend practicing instruments on Monday?

3. Ms. How bought a bag of rice for dinner. She used $\frac{3}{5}$ kg of the rice and still had $2\frac{1}{4}$ kg left. How heavy was the bag of rice that Ms. How bought?
4. Joe spends $\frac{2}{5}$ of his money on a jacket and $\frac{3}{8}$ of his money on a shirt. He spends the rest on a pair of pants. What fraction of his money does he use to buy the pants?

Name _____

Date _____

1. Add.

a. $2\frac{1}{2} + 1\frac{1}{5} =$

b. $2\frac{1}{2} + 1\frac{3}{5} =$

c. $1\frac{1}{5} + 3\frac{1}{3} =$

d. $3\frac{2}{3} + 1\frac{3}{5} =$

e. $2\frac{1}{3} + 4\frac{4}{7} =$

f. $3\frac{5}{7} + 4\frac{2}{3} =$

g. $15\frac{1}{5} + 4\frac{3}{8} =$

h. $18\frac{3}{8} + 2\frac{2}{5} =$

2. Angela practiced piano for $2\frac{1}{2}$ hours on Friday, $2\frac{1}{3}$ hours on Saturday, and $3\frac{2}{3}$ hours on Sunday. How much time did Angela practice piano during the weekend?

3. String A is $3\frac{5}{6}$ meters long. String B is $2\frac{1}{4}$ meters long. What's the total length of both strings?

4. Matt says that $5 - 1\frac{1}{4}$ will be more than 4, since $5 - 1$ is 4. Draw a picture to prove that Matt is wrong.

Name _____

Date _____

1. Generate equivalent fractions to get like units. Then, subtract.

a. $\frac{1}{2} - \frac{1}{5} =$

b. $\frac{7}{8} - \frac{1}{3} =$

c. $\frac{7}{10} - \frac{3}{5} =$

d. $1\frac{5}{6} - \frac{2}{3} =$

e. $2\frac{1}{4} - 1\frac{1}{5} =$

f. $5\frac{6}{7} - 3\frac{2}{3} =$

g. $15\frac{7}{8} - 5\frac{3}{4} =$

h. $15\frac{5}{8} - 3\frac{1}{3} =$

2. Sandy ate $\frac{1}{6}$ of a candy bar. John ate $\frac{3}{4}$ of it. How much more of the candy bar did John eat than Sandy?
3. $4\frac{1}{2}$ yards of cloth are needed to make a woman's dress. $2\frac{2}{7}$ yards of cloth are needed to make a girl's dress. How much more cloth is needed to make a woman's dress than a girl's dress?
4. Bill reads $\frac{1}{5}$ of a book on Monday. He reads $\frac{2}{3}$ of the book on Tuesday. If he finishes reading the book on Wednesday, what fraction of the book did he read on Wednesday?
5. Tank A has a capacity of 9.5 gallons. $6\frac{1}{3}$ gallons of the tank's water are poured out. How many gallons of water are left in the tank?

Name _____

Date _____

1. Subtract.

a. $3\frac{1}{4} - 2\frac{1}{3} =$

b. $3\frac{2}{3} - 2\frac{3}{4} =$

c. $6\frac{1}{5} - 4\frac{1}{4} =$

d. $6\frac{3}{5} - 4\frac{3}{4} =$

e. $5\frac{2}{7} - 4\frac{1}{3} =$

f. $8\frac{2}{3} - 3\frac{5}{7} =$

g. $18\frac{3}{4} - 5\frac{7}{8} =$

h. $17\frac{1}{5} - 2\frac{5}{8} =$

2. Tony wrote the following:

$$7\frac{1}{4} - 3\frac{3}{4} = 4\frac{1}{4} - \frac{3}{4}.$$

Is Tony's statement correct? Draw a number line to support your answer.

3. Ms. Sanger blended $8\frac{3}{4}$ gallons of iced tea with some lemonade for a picnic. If there were $13\frac{2}{5}$ gallons of the beverage, how many gallons of lemonade did she use?
4. A carpenter has $10\frac{1}{2}$ feet of wooden plank. He cuts off $4\frac{1}{4}$ feet to replace the slat of a deck and $3\frac{2}{3}$ feet to repair a bannister. He uses the rest of the plank to fix a stair. How many feet of wood does the carpenter use to fix the stair?

Name _____

Date _____

1. Are the following expressions greater than or less than 1? Circle the correct answer.

a. $\frac{1}{2} + \frac{4}{9}$ greater than 1 less than 1

b. $\frac{5}{8} + \frac{3}{5}$ greater than 1 less than 1

c. $1\frac{1}{5} - \frac{1}{3}$ greater than 1 less than 1

d. $4\frac{3}{5} - 3\frac{3}{4}$ greater than 1 less than 1

2. Are the following expressions greater than or less than $\frac{1}{2}$? Circle the correct answer.

a. $\frac{1}{5} + \frac{1}{4}$ greater than $\frac{1}{2}$ less than $\frac{1}{2}$

b. $\frac{6}{7} - \frac{1}{6}$ greater than $\frac{1}{2}$ less than $\frac{1}{2}$

c. $1\frac{1}{7} - \frac{5}{6}$ greater than $\frac{1}{2}$ less than $\frac{1}{2}$

d. $\frac{4}{7} + \frac{1}{8}$ greater than $\frac{1}{2}$ less than $\frac{1}{2}$

3. Use $>$, $<$, or $=$ to make the following statements true.

a. $5\frac{4}{5} + 2\frac{2}{3}$ _____ $8\frac{3}{4}$

b. $3\frac{4}{7} - 2\frac{3}{5}$ _____ $1\frac{4}{7} + \frac{3}{5}$

c. $4\frac{1}{2} + 1\frac{4}{9}$ _____ $5 + \frac{13}{18}$

d. $10\frac{3}{8} - 7\frac{3}{5}$ _____ $3\frac{3}{8} + \frac{3}{5}$

4. Is it true that $5\frac{2}{3} - 3\frac{3}{4} = 1 + \frac{2}{3} + \frac{3}{4}$? Prove your answer.
5. A tree limb hangs $5\frac{1}{4}$ feet from a telephone wire. The city trims back the branch *before* it grows within $2\frac{1}{2}$ feet of the wire. Will the city allow the tree to grow $2\frac{3}{4}$ more feet?
6. Mr. Kreider wants to paint two doors and several shutters. It takes $2\frac{1}{8}$ gallons of paint to coat each door and $1\frac{3}{5}$ gallons of paint to coat all of his shutters. If Mr. Kreider buys three 2-gallon cans of paint, does he have enough to complete the job?

Name _____

Date _____

1. Rearrange the terms so that you can add or subtract mentally. Then, solve.

a. $1\frac{3}{4} + \frac{1}{2} + \frac{1}{4} + \frac{1}{2}$

b. $3\frac{1}{6} - \frac{3}{4} + \frac{5}{6}$

c. $5\frac{5}{8} - 2\frac{6}{7} - \frac{2}{7} - \frac{5}{8}$

d. $\frac{7}{9} + \frac{1}{2} - \frac{3}{2} + \frac{2}{9}$

2. Fill in the blank to make the statement true.

a. $7\frac{3}{4} - 1\frac{2}{7} - \frac{3}{2} = \underline{\hspace{2cm}}$

b. $9\frac{5}{6} + 1\frac{1}{4} + \underline{\hspace{2cm}} = 14$

c. $\frac{7}{10} - \underline{\hspace{2cm}} + \frac{3}{2} = \frac{6}{5}$

d. $\underline{\hspace{2cm}} - 20 - 3\frac{1}{4} = 14\frac{5}{8}$

e. $\frac{17}{3} + \underline{\hspace{2cm}} + \frac{5}{2} = 10\frac{4}{5}$

f. $23.1 + 1\frac{7}{10} - \underline{\hspace{2cm}} = \frac{66}{10}$

3. Laura bought $8\frac{3}{10}$ yd of ribbon. She used $1\frac{2}{5}$ yd to tie a package and $2\frac{1}{3}$ yd to make a bow. Joe later gave her $4\frac{3}{5}$ yd. How much ribbon does she now have?

4. Mia bought $10\frac{1}{9}$ lb of flour. She used $2\frac{3}{4}$ lb of flour to bake banana cakes and some to bake chocolate cakes. After baking all the cakes, she had $3\frac{5}{6}$ lb of flour left. How much flour did she use to bake the chocolate cakes?

Name _____

Date _____

Solve the word problems using the RDW strategy. Show all of your work.

1. A baker buys a 5 lb bag of sugar. She uses $1\frac{2}{3}$ lb to make some muffins and $2\frac{3}{4}$ lb to make a cake. How much sugar does she have left?

2. A boxer needs to lose $3\frac{1}{2}$ kg in a month to be able to compete as a flyweight. In three weeks, he lowers his weight from 55.5 kg to 53.8 kg. How many kilograms must the boxer lose in the final week to be able to compete as a flyweight?

3. A construction company builds a new rail line from Town A to Town B. They complete $1\frac{1}{4}$ miles in their first week of work and $1\frac{2}{3}$ miles in the second week. If they still have $25\frac{3}{4}$ miles left to build, what is the distance from Town A to Town B?
4. A catering company needs 8.75 lb of shrimp for a small party. They buy $3\frac{2}{3}$ lb of jumbo shrimp, $2\frac{5}{8}$ lb of medium-sized shrimp, and some mini-shrimp. How many pounds of mini-shrimp do they buy?

5. Mark breaks up a 9-hour drive into 3 segments. He drives $2\frac{1}{2}$ hours before stopping for lunch. After driving some more, he stops for gas. If the second segment of his drive was $1\frac{2}{3}$ hours longer than the first segment, how long did he drive after stopping for gas?

Name _____

Date _____

Draw the following roads.

- a. 1 road. The piece shown below is only $\frac{3}{7}$ of the whole. Complete the drawing to show the whole road.



- b. 1 road. The piece shown below is $\frac{1}{6}$ of the whole. Complete the drawing to show the whole road.



- c. 3 roads, A, B, and C. B is three times longer than A. C is twice as long as B. Draw the roads. What fraction of the total length of the roads is the length of A? If Road B is 7 miles longer than Road A, what is the length of Road C?

- d. Write your own road problem with 2 or 3 lengths.









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