

MODULE 8

Fractions in Real Life

Ralph's stock in the company rose $1 \frac{7}{8}$ points last month and $3 \frac{1}{4}$ points this month. How much did the stock rise altogether?

Canada

EMPLOYMENT
ONTARIO

Ontario



Module 8: Fractions in Real Life

In this module, you will be learning several skills for success. Skills for success are skills needed in everyday life to be successful at work, when learning and for life.

(Retrieved from: <https://www.canada.ca/en/services/jobs/training/initiatives/skills-success.html>)

In this module you will practice the following skills for success:

- a) **Numeracy:** Numeracy skills are critical to your success in today's society. Numeracy skills are necessary at work, in everyday life and in learning environments. You require these skills to understand numbers, perform calculations, manage budgets, interpret data and make estimations.
- b) **Problem Solving:** Problem solving skills help you to make decisions, solve problems and make changes. Improving your problem solving skills will help you make better decisions by teaching you to identify a problem, gather the correct information and solve the problem.
- c) **Reading:** Reading is important at work and in daily life activities to keep you informed, safe and successful. Reading is also important in order to learn new skills. This module will help you practice locating information through words, symbols and pictures.
- d) **Writing:** The ability to communicate with other people to share information using words, symbols or images is important for success at work, in a learning environment and everyday life. Improving your writing skills will ensure you are communicating clearly and effectively in various situations.

PART 1

Fractions

Paula shops at Katy's Kitchen. She buys a magnet to put on her dishwasher so her family knows if the dishes inside are clean or dirty. She buys the magnet with one half shaded. Which magnet did she buy?

Dirty	
	Clean

Magnet 1

DIRTY	
CLEAN	

Magnet 2

Dirty	
	Clean

Magnet 3

Paula chose Magnet 2. This magnet has 2 equal parts or 2 halves. One half is shaded.

A fraction names part of a region or part of a group. You write the fraction one half as $\frac{1}{2}$.

- $\frac{1}{2}$ ← The numerator is the number of parts shaded.
2 ← The denominator is the total number of equal parts.

Example: Jerry ate 3 pieces of cherry pie. What fraction of the pie did Jerry eat?

The numerator is the number of pieces of pie that Jerry ate, 3.

The denominator is the total number of pieces in the whole pie, 8.

Jerry ate $\frac{3}{8}$ of the pie

A fraction names part of a group.



Of the 6 balls, 2 are footballs.

Two sixths of the balls are footballs.

Write: $\frac{2}{6}$

Of the balls, 2 are basketballs.

Three sixths of the balls are basketballs.

Write: $\frac{3}{6}$

Example: Dan coaches his son's little league team. There are 10 players on the team. Three of the players bat left-handed. What fraction of the players bat left handed? What fraction of the players bat right-handed?

Three out of 10 players bat left-handed, so three tenths of the players bat left-handed.

Write: $\frac{3}{10}$

Seven out of the 10 players are right-handed, so seven tenths of the players bat right-handed.

Write: $\frac{7}{10}$

Exercise 1A

Write the fraction for the shaded part.

1.



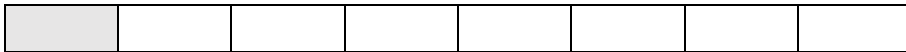
2.



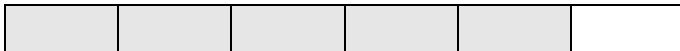
3.



4.



5.



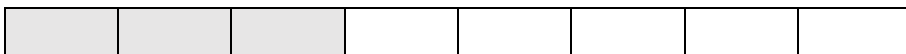
6.



Exercise 1B

What fraction is shaded?

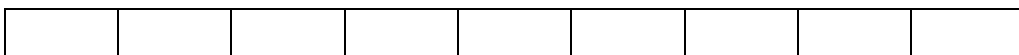
7.



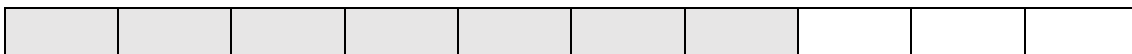
8.



9.



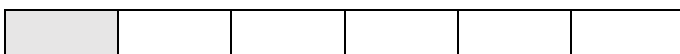
10.



11.



12.



Exercise 1C**Write the fraction.**

13. two thirds _____

14. One fifth _____

15. seventh eighths _____

16. One half _____

17. three fourths _____

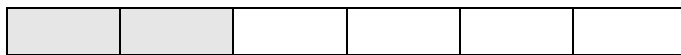
18. Nine tenths _____

Exercise 1D**Complete.**

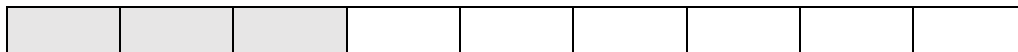
19.

 $\frac{1}{2}$ are shaded. $\frac{1}{2}$ of 8 is _____

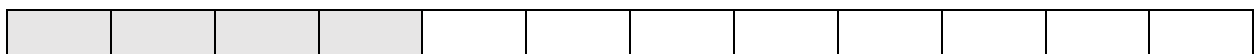
20.

 $\frac{1}{3}$ are shaded. $\frac{1}{3}$ of 6 is _____

21.

 $\frac{1}{3}$ are shaded. $\frac{1}{3}$ of 9 is _____

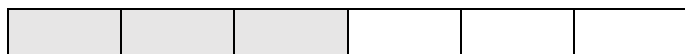
22.

 $\frac{1}{3}$ are shaded. $\frac{1}{3}$ of 12 is _____

23.

 $\frac{1}{4}$ are shaded. $\frac{1}{4}$ of 12 is _____

24.

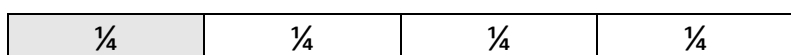


$\frac{1}{2}$ are shaded. $\frac{1}{2}$ of 6 is _____

PART 2

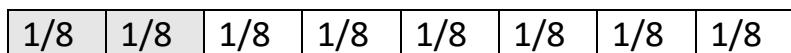
Equivalent Fractions

This rectangle is divided into 4 equal parts.



$\frac{1}{4}$ of the rectangle is shaded.

This rectangle is divided into 8 equal parts.

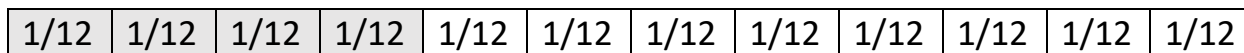
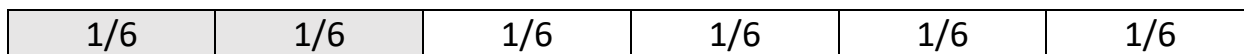


$\frac{2}{8}$ of the rectangle is shaded.

Look at both rectangles. You can see that $\frac{1}{4}$ and $\frac{2}{8}$ are the same size.

$\frac{1}{4}$ and $\frac{2}{8}$ are equivalent fractions.

Example: Write an equivalent fraction.



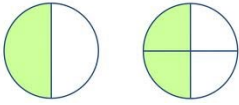
You can also find equivalent fractions by multiplying the numerator and the denominator by the same number, except zero.

$$\frac{2}{6} = \frac{2 \times 2}{6 \times 2} = \frac{4}{12}$$

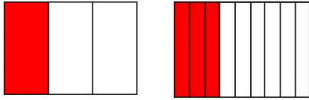
Exercise 2A

Write a number sentence to show equivalent fractions.

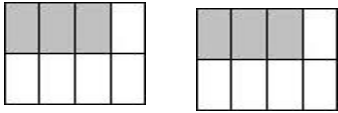
1.



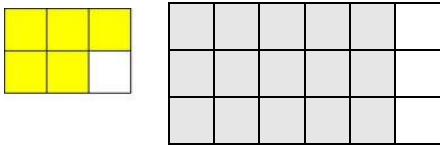
2.



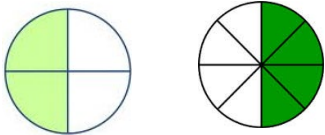
3.



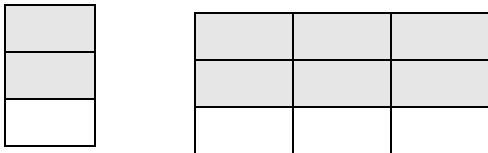
4.



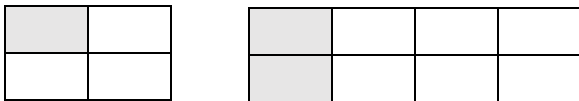
5.



6.



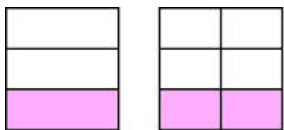
7.



8.



9.



Exercise 2B

Write the equivalent fraction.

10.	$\frac{1}{6} = \frac{1 \times 2}{6 \times 2} =$	11.	$\frac{1}{2} = \frac{1 \times 6}{2 \times 6} =$	12.	$\frac{1}{8} = \frac{1 \times 4}{8 \times 4} =$
13.	$\frac{3}{7} = \frac{3 \times 2}{7 \times 2} =$	14.	$\frac{3}{10} = \frac{3 \times 5}{10 \times 5} =$	15.	$\frac{1}{7} = \frac{1 \times 2}{7 \times 2} =$
16.	$\frac{2}{9} = \frac{2 \times 2}{9 \times 2} =$	17.	$\frac{5}{6} = \frac{5 \times 3}{6 \times 3} =$	18.	$\frac{6}{7} = \frac{6 \times 4}{7 \times 4} =$

PART 3

Simplest Form

You can find equivalent fractions by dividing the numerator and the denominator by a common factor greater than one.

--	--	--	--	--	--	--	--	--	--

--	--	--	--	--

$$\frac{8}{10} = \frac{8 \div 2}{10 \div 2} = \frac{4}{5}$$

The numerator and the denominator of the fraction $\frac{4}{5}$ cannot be divided by a common factor greater than one. The fraction $\frac{4}{5}$ is in simplest form.

Example: Write the fraction in simplest form.

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

$4/12 =$ $2/6 =$ $1/3$

Example: Write 5/5 in simplest form.

If the numerator and the denominator are the same number, the fraction is equal to 1.

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

Exercise 3A

1. $2/4 =$ 2. $2/6 =$ 3. $4/8 =$

Exercise 3B

Complete.

4.	$\frac{3}{9} = \frac{3 \div 3}{9 \div 3} =$	5.	$\frac{10}{15} = \frac{10 \div 5}{15 \div 5} =$	6.	$\frac{4}{10} = \frac{4 \div 2}{10 \div 2} =$
7.	$\frac{6}{8} = \frac{6 \div 2}{8 \div 2} =$	8.	$\frac{5}{20} = \frac{5 \div 5}{20 \div 5} =$	9.	$\frac{8}{12} = \frac{8 \div 4}{12 \div 4} =$
10.	$\frac{12}{24} = \frac{12 \div 12}{24 \div 12} =$	11.	$\frac{7}{14} = \frac{7 \div 7}{14 \div 7} =$	12.	$\frac{8}{8} = \frac{8 \div 8}{8 \div 8} =$

Exercise 3C
Complete.

13.	$\frac{8}{16} = \frac{\quad}{2}$	14.	$\frac{4}{16} = \frac{\quad}{4}$	15.	$\frac{7}{28} = \frac{1}{\quad}$
16.	$\frac{8}{20} = \frac{\quad}{5}$	17.	$\frac{2}{10} = \frac{1}{\quad}$	18.	$\frac{3}{15} = \frac{\quad}{5}$

PART 4

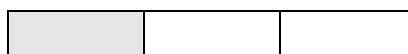
Mixed Numbers

Sometimes the numerator of a fraction is greater than the denominator. When this happens, the fraction is greater than 1. A fraction greater than 1 is called a mixed number.

Look at the diagram.



$\frac{3}{3}$



$\frac{1}{3}$

Write the fraction for the shaded parts. $\frac{4}{3}$

Since the numerator 4 is greater than 3, we can write a mixed number.

One whole rectangle is shaded and one third of the other rectangle is shaded.

We write the mixed number as $1 \frac{1}{3}$.

Example: Write $\frac{7}{4}$ as a mixed number.
 You can write a fraction as a mixed number by dividing the numerator by the denominator.

$$\frac{7}{4} \longrightarrow \begin{array}{r} \underline{1} \\ 4 \overline{) 7} \\ \underline{-4} \\ 3 \end{array} \text{ R3} \longrightarrow 1\frac{3}{4}$$

remainder
divisor

The remainder becomes the numerator.
 The divisor becomes the denominator.
 Sometimes a fraction names a whole number with no remainders.

$$\frac{6}{3} \longrightarrow \begin{array}{r} \underline{2} \\ 3 \overline{) 6} \end{array} \longrightarrow \frac{6}{3} = 2$$

Exercise 4A

Write the fraction as a mixed number in simplest form or as a whole number.

1. $\frac{11}{8} =$ 2. $\frac{16}{6} =$

3. $\frac{20}{10} =$ 4. $\frac{13}{9} =$

Exercise 4B

Write the fraction as a whole number.

5. $\frac{20}{5} =$ 6. $\frac{14}{7} =$ 7. $\frac{40}{8} =$ 8. $\frac{35}{7} =$

Exercise 4C

Write the fraction as a mixed number in simplest form.

9. $\frac{8}{5} =$ 10. $\frac{11}{5} =$ 11. $\frac{10}{3} =$ 12. $\frac{20}{6} =$

13. $22/9 =$

14. $13/7 =$

15. $14/4 =$

16. $12/8 =$

Exercise 4D

Solve.

17. Yolanda needs 16 grapefruit halves to serve to her guests. How many grapefruits does she need?

18. Ricky picked 22 peaches. Each small carton holds 6 peaches. Write a mixed number to show how many cartons Ricky filled with peaches.

PART 5

Adding Fractions with Like Denominators

Bill and Ted are working on the company newsletter. They want $1/6$ of the newsletter to be on new employees and $4/6$ of the newsletter to be on new policies. How much of the newsletter have they planned so far?

To find out, add the fractions.

One sixth + four sixths = five sixths

To add fractions with like denominators, add the numerators. Write the sum over the same or like denominator. Remember always write the sum in simplest form.

$$1/6 + 4/6 = 5/6$$

Keep the same denominator. Add the numerators.

Add $\frac{1}{8} + \frac{3}{8}$. Write the sum in simplest form.

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

Example: Danielle is using a recipe that calls for $\frac{1}{3}$ cup of flour. She wants to double it for high altitude baking. How much flour does she need?

To find out, add the fractions.

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

Keep the same denominator. Add the numerators.

Danielle needs $\frac{2}{3}$ cup of flour.

Exercise 5A

Add. Write the sum in simplest form.

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

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

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

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

5. $\frac{1}{8} + \frac{5}{8} =$

6. $\frac{1}{8} + \frac{2}{8} =$

7. $\frac{3}{9} + \frac{2}{9} =$

8. $\frac{3}{9} + \frac{3}{9} =$

9. $\frac{5}{9} + \frac{3}{9} =$

Exercise 5B

Add. Write the sum in simplest form.

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

11. $\frac{2}{8} + \frac{4}{8} =$

12. $\frac{1}{8} + \frac{6}{8} =$

13. $\frac{5}{12} + \frac{3}{12} =$

14. $\frac{1}{10} + \frac{4}{10} =$

15. $\frac{3}{9} + \frac{4}{9} =$

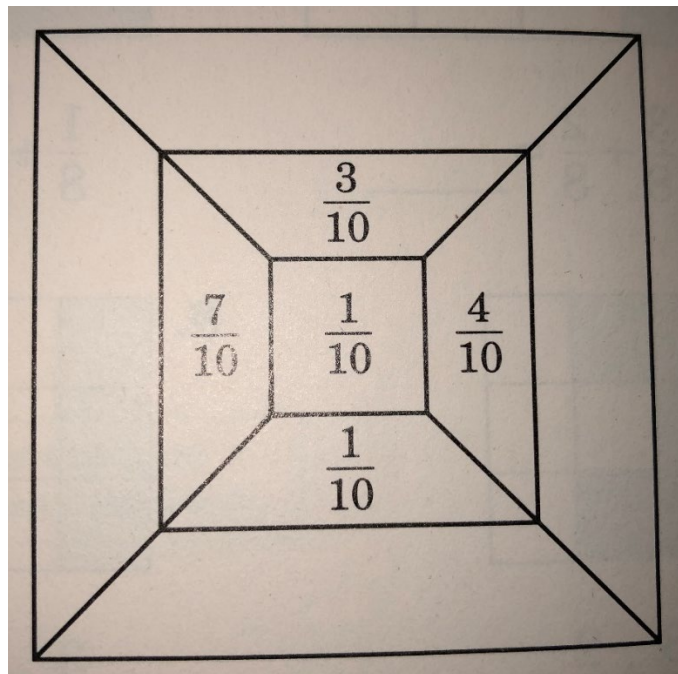
Exercise 5C
Solve.

16. Jessica ate $\frac{1}{8}$ of the apple pie on Monday. Roger ate $\frac{2}{8}$ of the pie on Tuesday. How much of the pie did they eat?

17. Rosa walked $\frac{3}{10}$ km on Saturday and $\frac{5}{10}$ km on Sunday. How far did Rosa walk altogether?

MENTAL MATH

Add the fraction in the middle to each fraction in the outer ring. Use mental math. Write each sum in simplest form.



PART 6

Subtracting Fractions with Like Denominators

Betty buys a piece of ribbon that is $\frac{7}{10}$ yd long.

She uses $\frac{3}{10}$ of a yard. How much ribbon does she have left? To find out, subtract.

				X	X	X			
--	--	--	--	---	---	---	--	--	--

To subtract fractions with the same denominators, subtract the numerators. Write the difference over the same denominator. Remember to write the difference in simplest form.

$$\frac{7}{10} - \frac{3}{10} = \frac{4}{10}$$

Subtract the numerators. $7 - 3 = 4$

$$\frac{7}{10} - \frac{3}{10} = \frac{4}{10}$$

Write the same denominator.

$$\frac{7}{10} - \frac{3}{10} = \frac{4}{10} = \frac{2}{5}$$

Write in simplest form.

Betty has $\frac{2}{5}$ yd of ribbon left.

Subtract: $\frac{12}{16} - \frac{6}{16}$. Write the difference in simplest form.

		X	X
X	X	X	X

$$\frac{12}{16} - \frac{6}{16} = \frac{6}{16}$$

Subtract the numerators.

$$\frac{12}{16} - \frac{6}{16} = \frac{6}{16} = \frac{3}{8}$$

Write the difference in simplest form.

Example: Marcy uses $\frac{7}{8}$ of her backyard for a vegetable garden. She plants tomatoes in $\frac{3}{8}$ of the yard. How much of the yard does she use to plant other vegetables?

To find out, subtract.



$$\frac{7}{8} - \frac{3}{8} = \frac{4}{8} = \frac{2}{4} = \frac{1}{2}$$

Keep the same denominator. Subtract the numerators. Then simplify.

Exercise 6A

Subtract. Write the difference in simplest form.

1. $\frac{4}{10} - \frac{2}{10} =$

2. $\frac{8}{9} - \frac{2}{9} =$

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

4. $\frac{5}{8} - \frac{1}{8} =$

5. $\frac{11}{12} - \frac{3}{12} =$

6. $\frac{11}{16} - \frac{7}{16} =$

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

8. $\frac{9}{12} - \frac{4}{12} =$

9. $\frac{7}{10} - \frac{2}{10} =$

Exercise 6B

Subtract. Write the difference in simplest form.

10. $\frac{4}{5} - \frac{2}{5} =$

11. $\frac{5}{6} - \frac{2}{6} =$

12. $\frac{7}{12} - \frac{2}{12} =$

13. $\frac{10}{12} - \frac{2}{12} =$

14. $\frac{8}{15} - \frac{3}{15} =$

15. $\frac{15}{16} - \frac{9}{16} =$

Exercise 6C
Solve.

16. Joanne walked $\frac{11}{12}$ km on Monday and $\frac{5}{12}$ km on Tuesday. How much farther did she walk on Monday?

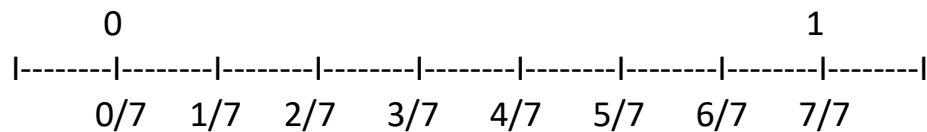
17. Barry's stock rose $\frac{7}{16}$ on Thursday and $\frac{11}{16}$ on Friday. How much more did his stock rise on Friday than on Thursday?

18. Katy has a piece of embroidery thread that is $\frac{7}{12}$ m long. She cuts the thread into two pieces. One piece measures $\frac{3}{12}$ m long. What is the length of the other piece?

PART 7

Comparing Fractions

You can compare fractions using a number line.



Compare $\frac{1}{7}$ and $\frac{5}{7}$. Since the denominators are the same, compare the numerators.

$1 < 5$, so $\frac{1}{7} < \frac{5}{7}$

Example: Compare $\frac{1}{4}$ and $\frac{3}{8}$.

Since the denominators are not the same, write an equivalent fraction.

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

Now compare. $2/8 < 3/8$ so $1/4 < 3/8$.

Is $6/7$ closer to 1, $1/2$, or 0?

ESTIMATING

You can estimate that $6/7$ is close to 1 because the numerator is almost as great as the denominator. $7/12$ is close to $1/2$ because the denominator is about twice the numerator.

$1/16$ is close to 0 because the numerator is so much less than the denominator.

Exercise 7A

Compare. Write $<$, $>$, or $=$.

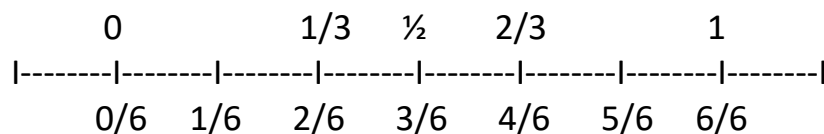
1. $4/6$ _____ $1/3$ 2. $3/4$ _____ $3/8$ 3. $1/3$ _____ $4/9$

Exercise 7B

Compare. Write $<$, $>$, or $=$. Use the number line.

4. $2/6$ _____ $1/3$ 5. $5/6$ _____ $2/3$

6. $1/2$ _____ $1/6$ 7. $1/3$ _____ $6/6$



Exercise 7C**Compare. Write $<$, $>$, or $=$.**

8. $\frac{3}{4}$ ____ $\frac{1}{8}$ 9. $\frac{2}{3}$ ____ $\frac{5}{6}$ 10. $\frac{5}{9}$ ____ $\frac{1}{3}$ 11. $\frac{1}{2}$ ____ $\frac{7}{8}$

12. $\frac{5}{20}$ ____ $\frac{10}{15}$ 13. $\frac{3}{5}$ ____ $\frac{4}{10}$ 14. $\frac{2}{4}$ ____ $\frac{4}{8}$ 15. $\frac{6}{7}$ ____ $\frac{8}{14}$

ESTIMATING**Estimate. Tell whether the fraction is about 1, $\frac{1}{2}$, or 0.**

16. $\frac{8}{9}$ 17. $\frac{1}{3}$ 18. $\frac{1}{12}$ 19. $\frac{6}{7}$

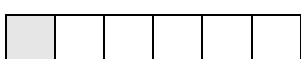
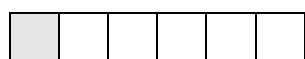
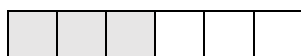
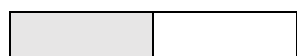
20. $\frac{5}{8}$ 21. $\frac{3}{4}$ 22. $\frac{11}{12}$ 23. $\frac{7}{12}$

PART 8

Adding Fractions with Unlike Denominators

Mike made a tape of his favourite songs. One half of the tape contains dance music and $\frac{1}{6}$ of the tape contains rock music. What part of the tape has he used so far?

To find out, add.



Change $\frac{1}{2}$ to a fraction with a common denominator.

Step 1	Step 2	Step 3
$\frac{1}{2}$	$\frac{1}{2} = \frac{3}{6}$	$\frac{1}{2} = \frac{3}{6}$
$+\frac{1}{6}$	$+\frac{1}{6} = \frac{1}{6}$	$+\frac{1}{6} = \frac{1}{6}$
		$\frac{4}{6} = \frac{2}{3}$

Write the answer in simplest form.

Example: Add $\frac{4}{5}$ and $\frac{3}{10}$

Step 1	Step 2	Step 3
$\frac{4}{5}$	$\frac{4}{5} = \frac{8}{10}$	$\frac{4}{5} = \frac{8}{10}$
$+\frac{3}{10}$	$+\frac{3}{10} = \frac{3}{10}$	$+\frac{3}{10} = \frac{3}{10}$
		$\frac{11}{10} = 1 \frac{1}{10}$

Write the answer in simplest form.

You can only add fractions when you have a common denominator.

Example: Add $1 \frac{1}{3} + 3 \frac{3}{6}$

Step 1	Step 2
$\begin{array}{r} 1 \frac{1}{3} \\ + 3 \frac{3}{6} \\ \hline \end{array}$	$\begin{array}{r} 1 \frac{1}{3} = 1 \frac{2}{6} \\ + 3 \frac{3}{6} = 3 \frac{3}{6} \\ \hline 4 \frac{5}{6} \end{array}$

Step 1 Write the fraction with a common denominator.

Step 2 Add the fractions. Then add the whole numbers.

Example: Ernie bought $2 \frac{3}{4}$ gal of gas on Tuesday and $8 \frac{2}{3}$ gal on Saturday. How much gas did he buy in all?

To find out, add.

Step 1	Step 2	Step 3
$\begin{array}{r} 2 \frac{3}{4} = \frac{3 \times 3}{4 \times 3} = \frac{9}{12} \\ + 8 \frac{2}{3} = \frac{2 \times 4}{3 \times 4} = \frac{8}{12} \end{array}$	$\begin{array}{r} 2 \frac{3}{4} = 2 \frac{9}{12} \\ + 8 \frac{2}{3} = 8 \frac{8}{12} \\ \hline 10 \frac{17}{12} \end{array}$	$10 \frac{17}{12} = 10 + 1 \frac{5}{12} = 11 \frac{5}{12}$

Step 1 Write fractions with a common denominator.

Step 2 Add fractions. Then add the whole numbers.

Step 3 Rename $\frac{17}{12}$ to a mixed number. Write the sum in simplest form.

Ernie bought $1 \frac{5}{12}$ gal of gas.

Exercise 8A

1.

$$\frac{1}{3} = \frac{\quad}{6}$$

2.

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

3.

$$\frac{1}{6} = \frac{3}{\quad}$$

4.

$$\frac{2}{5} = \frac{\quad}{10}$$

5.

$$2 \frac{2}{3} = 2 \frac{\quad}{6}$$

6.

$$4 \frac{6}{5} = 5 \frac{\quad}{5}$$

7.

$$6 \frac{5}{6} = 6 \frac{10}{\quad}$$

8.

$$1 \frac{10}{9} = 2 \frac{1}{\quad}$$

Exercise 8B

Add. Write the sum in simplest form.

9. $\frac{3}{4} + \frac{3}{8} =$

10. $\frac{3}{10} + \frac{1}{5} =$

11. $\frac{1}{12} + \frac{2}{3} =$

12. $\frac{5}{12} + \frac{1}{3} =$

13. $\frac{2}{5} + \frac{7}{10} =$

14. $\frac{7}{8} + \frac{1}{4} =$

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

16. $\frac{1}{12} + \frac{1}{4} =$

17. $2 \frac{1}{3} + 3 \frac{1}{2} =$

18. $4 \frac{5}{7} + 2 \frac{3}{14} =$

19. $7 \frac{3}{4} + 2 \frac{1}{5} =$

20. $1 \frac{2}{3} + 2 \frac{1}{4} =$

21. $2 \frac{5}{8} + 1 \frac{5}{6} =$

22. $3 \frac{4}{5} + 2 \frac{2}{3} =$

23. $4 \frac{3}{10} + 3 \frac{13}{20} =$

24. $8 \frac{11}{12} + 3 \frac{1}{4} =$

PART 9

Subtracting Fractions with Unlike Denominators

Bailey buys $\frac{11}{12}$ yd of wrapping paper. She uses $\frac{1}{3}$ yd to wrap a gift. How much wrapping paper does she have left?

To find out, subtract.

Step 1	Step 2	Step 3
$\frac{11}{12}$ $- \frac{1}{3}$	$\frac{11}{12} = \frac{11}{12}$ $- \frac{1}{3} = \frac{4}{12}$	$\frac{11}{12} = \frac{11}{12}$ $- \frac{1}{3} = \frac{4}{12}$ $\underline{ 7}$ <p>Write the difference in simplest form.</p>

Step 1 Determine if the denominators are the same.

Step 2 Change $\frac{1}{3}$ to an equivalent fraction with a common denominator.

Step 3 Subtract. Write the difference in simplest form.

Bailey has $\frac{7}{12}$ yd of paper left.

Example: Subtract: $\frac{6}{8} - \frac{1}{4}$.

Step 1	Step 2	Step 3
$\frac{6}{8}$ $- \frac{1}{4}$	$\frac{6}{8} = \frac{6}{8}$ $- \frac{1}{4} = \frac{2}{8}$	$\frac{6}{8} = \frac{6}{8}$ $- \frac{1}{4} = \frac{2}{8}$ $\underline{ 4}$ $\frac{4}{8} = \frac{1}{2}$ <p>Write the difference in simplest form.</p>

Remember, you can only subtract fractions with like denominators.

Example: Subtract $1 \frac{1}{6}$ from $3 \frac{2}{3}$.

Step 1	Step 2	Step 3
$3 \frac{2}{3} = \frac{4}{6}$ $- 1 \frac{1}{6} = \frac{1}{6}$	$3 \frac{2}{3} = 3 \frac{4}{6}$ $- 1 \frac{1}{6} = 1 \frac{1}{6}$ <hr/> $\frac{3}{6}$	$3 \frac{2}{3} = 3 \frac{4}{6}$ $- 1 \frac{1}{6} = 1 \frac{1}{6}$ <hr/> $2 \frac{3}{6} = 2 \frac{1}{2}$

Step 1 Write equivalent fractions with a common denominator.

Step 2 Subtract the fractions.

Step 3 Subtract the whole numbers.

Example: Pat bought $4 \frac{3}{4}$ yd of fabric. She used $2 \frac{3}{5}$ yd to make a costume for her son. How much fabric is left?
To find out, subtract.

Step 1	Step 2	Step 3
$4 \frac{3}{4} = 4 \frac{15}{20}$ $- 2 \frac{3}{5} = 2 \frac{12}{20}$	$4 \frac{3}{4} = 4 \frac{15}{20}$ $- 2 \frac{3}{5} = 2 \frac{12}{20}$ <hr/> $\frac{3}{20}$	$4 \frac{3}{4} = 4 \frac{15}{20}$ $- 2 \frac{3}{5} = 2 \frac{12}{20}$ <hr/> $2 \frac{3}{20}$ Write the difference in simplest form.

Step 1 Write equivalent fractions with a common denominator.

Step 2 Subtract the fractions.

Step 3 Subtract the whole numbers.

Exercise 9A
Subtract.

1. $7/8 - 1/16 =$

2. $2/3 - 3/9 =$

3. $3/4 - 1/8 =$

4. $3/5 - 1/10 =$

5. $3/4 - 1/2 =$

6. $1/2 - 1/6 =$

7. $5/8 - 1/2 =$

8. $4/5 - 1/2 =$

9. $2\frac{1}{2} - 1\frac{2}{7} =$

10. $4\frac{1}{2} - 2\frac{1}{3} =$

11. $5\frac{1}{4} - 2\frac{1}{12} =$

12. $6\frac{7}{9} - 2\frac{1}{3} =$

13. $5\frac{1}{3} - 2\frac{1}{4} =$

14. $3\frac{2}{3} - 1\frac{1}{2} =$

15. $6\frac{3}{5} - 2\frac{1}{10} =$

16. $8\frac{5}{6} - 3\frac{1}{8} =$

Exercise 9B
Solve.

17. Dorothy has $3\frac{3}{4}$ h to spend in the computer lab. She spent $1\frac{1}{2}$ h learning a new program. How much time does she have left to spend in the lab?

18. Valerie needs $\frac{5}{8}$ m of lace. She has $\frac{1}{3}$ m. How much more lace does she need?

PART 10

Problem Solving Strategy: Using a Circle Graph

Sylvia asked 12 friends what type of books they liked to read. She uses the results of her survey to make a circle graph.

<u>Type of Book</u>	<u>Number of People</u>	<u>Fraction</u>
Mystery	3	$\frac{3}{12} = \frac{1}{4}$
Romance	5	$\frac{5}{12}$
Biography	2	$\frac{2}{12} = \frac{1}{6}$
Adventure	1	$\frac{1}{12}$
Science Fiction	1	$\frac{1}{12}$
Total	12	$\frac{12}{12} = 1$

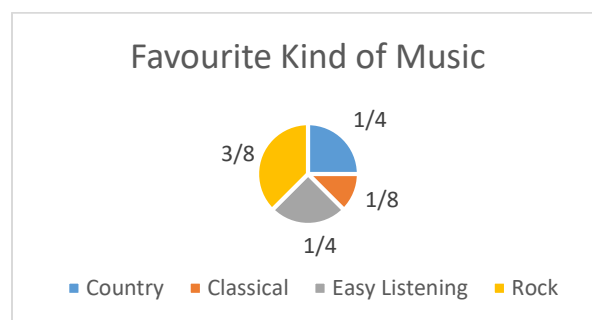
- Sylvia divides the circle in 12 equal parts because the fractions are in twelfths. Then she labels the graph with the information from the table above.
- Which fraction shows biography as the favourite type of book? $\frac{1}{6}$
- What fraction shows romance as the favourite type of book? $\frac{5}{12}$
- Do more people like adventure books than mystery books?
- Which is less, the fraction of people who chose science fiction or biography books?



Exercise 10A

Use the circle graph below to answer these questions.

1. What fraction of the people like rock music the best?
2. Do more people like country or classical music the best?
3. What fraction of the people like easy listening music?
4. What is the difference between the fraction of people who like rock music and country music?
5. What kind of music do the fewest people like?
6. Which is greater, the fraction of people who like rock music or the sum of the people who like country music and easy listening?



Exercise 10B

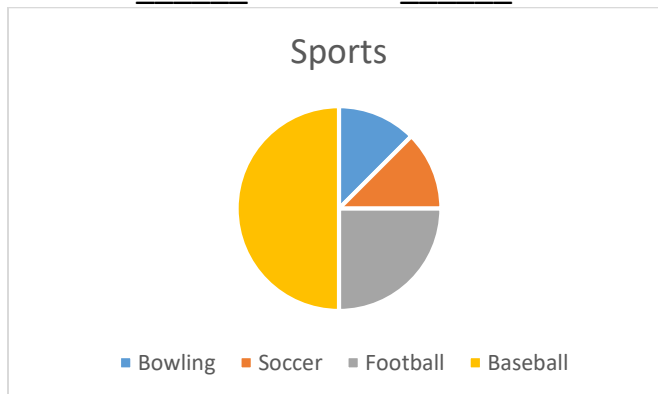
Write the fraction for each part of the circle graph.

Bowling _____

Football _____

Soccer _____

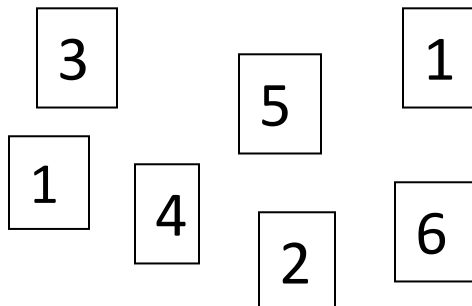
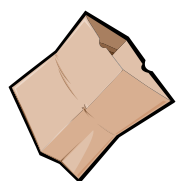
Baseball _____



APPLICATION

Probability

If you reached into the bag and did not look, what are the chances of picking the card with the 5 on it?



The chance that something will happen is called probability.

To find out the probability of picking a 5, look at the possible outcomes.

There are 7 number cards altogether. One of the cards is a 5. Therefore, your chances of picking the 5 are 1 out of 7.

You can represent the probability as a fraction:

$$\frac{\text{Number of 5 cards}}{\text{Total number of cards}}$$

The probability of picking a 5 is $\frac{1}{7}$.

Complete.

1. What is the probability of drawing a 4? _____

2. What is the probability of drawing a 6? _____

3. What is the probability of drawing a 7? _____

4. What is the probability of drawing a 1? _____

5. There is ____ chance in ____ of drawing a 2.

6. There are ____ chances in ____ of drawing a 1.

7. There are ____ chances in ____ of drawing a 9.

Module 8: Fractions in Real Life

Review 1

Write the fraction.

1. three fifths _____

2. One third _____

3. Six sevenths _____

Write the equivalent fraction.

4. $\frac{1}{3} = \frac{\quad}{9}$

5. $\frac{2}{5} = \frac{4}{\quad}$

6. $\frac{8}{9} = \frac{16}{\quad}$

7. $\frac{4}{7} = \frac{\quad}{14}$

Write the fraction in simplest form.

8. $\frac{8}{24} = \frac{\quad}{3}$

9. $\frac{5}{15} = \frac{1}{\quad}$

10. $\frac{6}{12} = \frac{\quad}{2}$

11. $\frac{4}{20} = \frac{1}{\quad}$

Add. Write the sum in simplest form.

12. $\frac{2}{4} + \frac{1}{4} =$

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

14. $\frac{7}{9} + \frac{1}{9} =$

15. $\frac{1}{3} + \frac{2}{6} =$

16. $\frac{2}{5} + \frac{3}{10} =$

17. $5\frac{1}{6} + 2\frac{3}{18} =$

18. $4\frac{6}{7} + 4\frac{3}{14} =$

Subtract.

19. $\frac{8}{9} - \frac{4}{9} =$

20. $\frac{1}{4} - \frac{1}{12} =$

21. $3\frac{1}{2} - 1\frac{1}{8} =$

22. $5\frac{3}{4} - 2\frac{1}{24} =$

PART 11

Multiplying Fractions and Whole Numbers

Mrs. Chandler supervises 18 cashiers in her department. Two thirds of them work at night. How many cashiers work at night?

Think: The word of implies multiplication. It means part of a whole.

$$18 \times \frac{2}{3} = \frac{18 \times 2}{3} = \frac{36}{3} = 12$$

Step 1 Multiply the numerator by the whole number.

Step 2 Write the product over the denominator.

Step 3 Write the fraction in simplest form.

Example: What is $\frac{1}{8}$ of 12?

$$12 \times \frac{1}{8} = \frac{12 \times 1}{8} = \frac{12}{8} = 1 \frac{4}{8} = 1 \frac{1}{2}$$

Changing the order of the factors does not change the product.

$$\frac{1}{8} \times 12 = \frac{1 \times 12}{8} = \frac{12}{8} = 1 \frac{4}{8} = 1 \frac{2}{4} = 1 \frac{1}{2}$$

Calculating

You can use a calculator to multiply a fraction and a whole number.

Multiply $4 \times \frac{3}{8}$.

Press $4 \times 3 \div 8 = 1.5$

$$\text{Check: } 4 \times \frac{3}{8} = \frac{4 \times 3}{8} = \frac{12}{8} = 1 \frac{1}{2}$$

Think: Are $1 \frac{1}{2}$ and 1.5 equal?

Exercise 11A

Multiply. Write the product in simplest form.

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

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

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

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

5. $20 \times \frac{3}{7} =$

6. $14 \times \frac{3}{4} =$

7. $\frac{2}{3} \times 10 =$

8. $\frac{5}{12} \times 6 =$

9. $5 \times \frac{3}{4} =$

10. $\frac{2}{9} \times 4 =$

11. $\frac{1}{8} \times 8 =$

12. $\frac{6}{7} \times 11 =$

13. $9 \times \frac{1}{4} =$

14. $33 \times \frac{1}{6} =$

15. $\frac{1}{11} \times 6 =$

16. $9 \times \frac{3}{10} =$

Exercise 11B

Solve.

17. There are 16 customers in line at the bank. One fourth of them are making deposits only. How many people are making deposits?

18. It is $\frac{7}{10}$ of a kilometer from Rebecca's office to the bus stop. How far does Rebecca walk to and from the bus stop each day?

19. There are 24 people in Joe's computer class. Two thirds of them were in his class last semester. How many people were in his class last semester?

PART 12

Multiplying Fractions

Multiply $\frac{1}{2} \times \frac{1}{4}$,

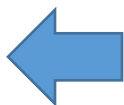
$$\frac{1}{2} \times \frac{1}{4} = \frac{1 \times 1}{2 \times 4} = \frac{1}{8}$$



To multiply two fractions, first multiply the numerators. Then multiply the denominators.

$$\frac{1}{8} < \frac{1}{4}$$

$$\frac{1}{8} < \frac{1}{2}$$



Since you are multiplying two amounts less than 1, the product will be less than either fraction.

Example: It took Suzanne $\frac{2}{3}$ hour to mow the lawn last week. It took her $\frac{3}{4}$ as long this week. What fraction of an hour did it take Suzanne to mow the lawn this week?

To find out, multiply $\frac{2}{3}$ and $\frac{3}{4}$.

$$\frac{2}{3} \times \frac{3}{4} = \frac{2 \times 3}{3 \times 4} = \frac{6}{12} = \frac{1}{2}$$

Step 1 Multiply the numerators.

Step 2 Multiply the denominators.

Step 3 Write the product in simplest form.

It took Suzanne $\frac{1}{2}$ hour to mow the lawn this week.

Exercise 12A**Multiply. Write the product in simplest form.**

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

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

3. $\frac{1}{6} \times \frac{1}{7} =$

4. $\frac{5}{8} \times \frac{1}{3} =$

5. $\frac{6}{7} \times \frac{1}{4} =$

6. $\frac{5}{6} \times \frac{7}{10} =$

7. $\frac{1}{6} \times \frac{3}{10} =$

8. $\frac{4}{5} \times \frac{1}{3} =$

9. $\frac{2}{9} \times \frac{5}{6} =$

10. $\frac{11}{12} \times \frac{1}{10} =$

11. $\frac{1}{12} \times \frac{2}{15} =$

12. $\frac{2}{3} \times \frac{5}{12} =$

13. $\frac{7}{9} \times \frac{1}{3} =$

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

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

16. $\frac{1}{2} \times \frac{1}{16} =$

17. $\frac{7}{10} \times \frac{2}{5} =$

18. $\frac{2}{5} \times \frac{3}{5} =$

Exercise 12B

Owen is making Blue Cheese Dip. He makes only half of the recipe. Use the information at the right to answer each question.

Blue Cheese Dip	
$\frac{1}{2}$ c	Crumbled blue cheese
$\frac{3}{4}$ c	Yogurt
$\frac{1}{3}$ c	Lemon juice
$\frac{1}{4}$ c	Sour cream
$\frac{1}{8}$ tsp	Garlic powder
Mix all the ingredients together. Chill	

19. How much of each ingredient should Owen use?

20. Owen used only $\frac{1}{3}$ of the dip he made. What fraction of the recipe did he use?

PART 13

Multiplying Mixed Numbers

Helene is buying carpeting for the family room. The room measures $7\frac{1}{2}$ ft wide and $8\frac{1}{3}$ ft long. How much carpeting is needed to cover the floor?

To find out, Multiply, $7\frac{1}{2} \times 8\frac{1}{3}$

Step 1 Write the mixed numbers as fractions by multiplying the denominator by the whole number. Add the numerator. Write this number over the denominator.

$$2 \times 7 + 1 \longrightarrow 7\frac{1}{2} = \frac{15}{2}$$

$$3 \times 8 + 1 \longrightarrow 8\frac{1}{3} = \frac{25}{3}$$

Step 2 Multiply the numerators. Multiply the denominators.

$$\frac{15}{2} \times \frac{25}{3} = \frac{15 \times 25}{2 \times 3} = \frac{375}{6} = 62\frac{1}{2} \text{ Write the product in simplest form.}$$

Helene needs $62\frac{1}{2}$ square feet of carpeting.

Example: Luke worked at the community center for $3\frac{1}{4}$ h each day for 4 days. How many hours did he work?

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

$$\frac{13}{4} \times 4 \quad \text{Write the mixed number as a fraction.}$$

$$\frac{13}{4} \times 4 = \frac{13 \times 4}{4} = \frac{52}{4} = 13 \text{ Write the product in simplest form.}$$

Luke worked 13 hours.

Exercise 13A**Multiply. Write the product in simplest form.**

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

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

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

4. $\frac{3}{4} \times 1\frac{1}{10} =$

5. $2\frac{3}{8} \times 1\frac{1}{2} =$

6. $4\frac{4}{5} \times 2\frac{3}{10} =$

7. $3\frac{6}{7} \times 4\frac{2}{3} =$

8. $5\frac{1}{6} \times 3 =$

9. $6\frac{1}{2} \times 3 =$

10. $2\frac{3}{5} \times 7 =$

11. $9 \times 1\frac{1}{3} =$

12. $2\frac{1}{9} \times 0 =$

13. $8\frac{1}{3} \times \frac{4}{5} =$

14. $5 \times 3\frac{1}{5} =$

15. $10\frac{1}{2} \times 3\frac{4}{7} =$

16. $3\frac{12}{13} \times 1 =$

17. $4\frac{1}{6} \times \frac{2}{3} =$

18. $\frac{1}{4} \times 3\frac{5}{6} =$

19. $1\frac{8}{9} \times 3 =$

20. $\frac{8}{11} \times 3\frac{1}{10} =$

21. $9 \times 1\frac{2}{9} =$

Exercise 13B

Solve.

22. Jackie is wallpapering 3 rooms in her house. It takes her $6\frac{1}{2}$ h to finish one room. How long will it take her to finish 3 rooms?

23. Wanda's Wallcoverings is open $8\frac{2}{3}$ h each day. Benny works $\frac{3}{4}$ of the time the store is open. How many hours does he work?

24. Wanda bought $3\frac{1}{4}$ m of decorative ribbon. She used $2\frac{2}{3}$ m. How much ribbon does she have left over?

PART 14

Dividing a Whole Number by a Fraction

Carrie is serving shrimp cocktail to her guests. She uses $\frac{1}{2}$ lemon for each plate. If she has 4 lemons how many guests can she serve?

There are 8 halves in 4 lemons.

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

Carrie can serve 8 guests.

Dividing a number gives the same result as multiplying the reciprocal of the number. Two numbers whose product is 1 are reciprocals.

$2 \times \frac{1}{2} = 1$, so 2 and $\frac{1}{2}$ are reciprocals.

Instead of dividing by $\frac{1}{2}$ you can multiply by 2.

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

Example: How many $\frac{1}{3}$ s are in 4?

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

Exercise 14A

What is the reciprocal of each number?

1. $\frac{1}{2} =$

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

3. $\frac{6}{7} =$

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

Exercise 14B

5. How many $\frac{1}{2}$ s in 3?

6. How many $\frac{1}{3}$ s in 3?

Exercise 14C

Divide. Write the quotient in simplest form.

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

8. $6 \div \frac{1}{3} =$

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

10. $8 \div \frac{3}{10} =$

11. $2 \div \frac{1}{8} =$

12. $5 \div \frac{1}{6} =$

13. $3 \div \frac{1}{4} =$

14. $5 \div \frac{1}{5} =$

15. $6 \div \frac{1}{7} =$

16. $4 \div \frac{2}{5} =$

17. $8 \div \frac{4}{5} =$

18. $10 \div \frac{1}{5} =$

CRITICAL THINKING

19. When you divide a whole number by a fraction, will the quotient be greater than or less than the whole number? Explain your answer.

PART 15

Dividing a Fraction by a Whole Number

Doug used $\frac{1}{3}$ of a roll of wrapping paper to wrap 2 presents. How much paper did he use for each gift?

To find out, divide $\frac{1}{3}$ by 2.

$$\frac{1}{3} \div 2 = \frac{1}{3} \times \frac{1}{2} = \frac{1}{6} \quad \text{The reciprocal of 2 is } \frac{1}{2}.$$

Step 1 Write the reciprocal of the whole number divisor.

Step 2 Multiply.

Example: Marcy has $\frac{2}{3}$ of a melon left over. She shares it equally among her 4 children. How much of the melon does each child receive?

To find out, divide $\frac{2}{3}$ by 4.

$$\frac{2}{3} \div 4 = \frac{2}{3} \times \frac{1}{4} = \frac{2}{12} = \frac{1}{6} \quad \text{The reciprocal of 4 is } \frac{1}{4}.$$

Step 1 Write the reciprocal of 4.

Step 2 Multiply.

Step 3 Write the quotient in simplest form.

CRITICAL THINKING

When you divide a fraction by a whole number, will the quotient be greater than or less than the dividend?

Exercise 15A

What is the reciprocal of each number?

1. $3 =$

2. $5 =$

3. $7 =$

4. $19 =$

Exercise 15B

Divide. Write the quotient in simplest form.

5. $1/3 \div 3 =$

6. $2/5 \div 4 =$

7. $3/8 \div 5 =$

8. $2/3 \div 5 =$

9. $1/6 \div 9 =$

10. $6/7 \div 4 =$

11. $3/11 \div 10 =$

12. $1/9 \div 7 =$

13. $1/4 \div 4 =$

14. $1/8 \div 4 =$

15. $2/7 \div 4 =$

16. $2/5 \div 5 =$

17. $1/6 \div 6 =$

18. $5/6 \div 5 =$

19. $2/3 \div 3 =$

20. $1/4 \div 3 =$

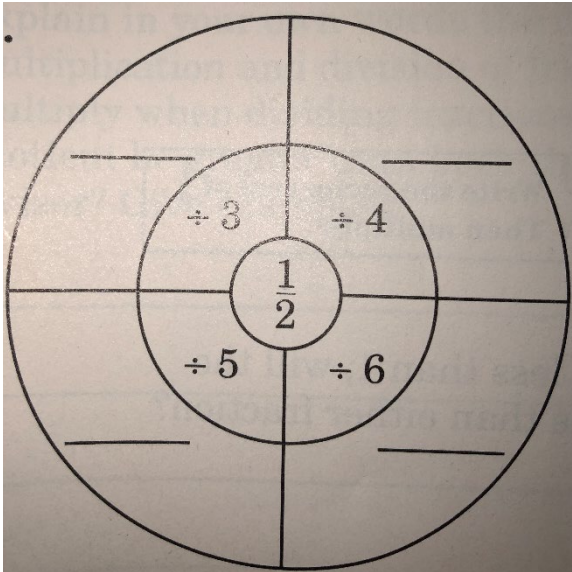
21. $3/4 \div 4 =$

22. $2/5 \div 7 =$

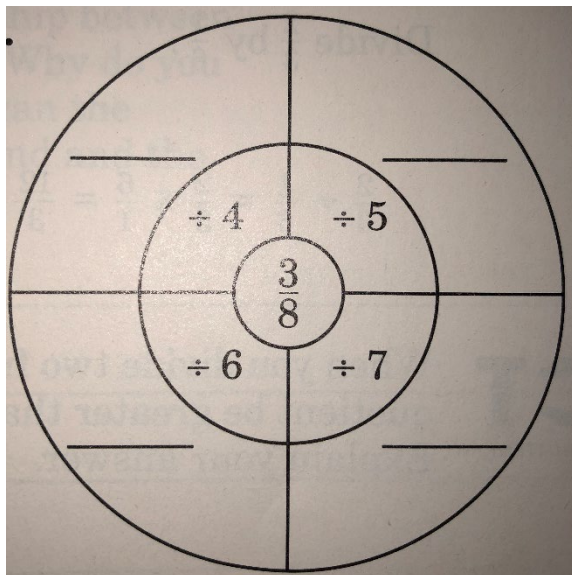
Exercise 15C

Complete and reduce answer to simplest form.

23.



24.



PART 16

Dividing a Fraction by a Fraction

Paula has $\frac{3}{4}$ yd of ribbon. She cuts it into pieces that measure $\frac{1}{8}$ yd long. How many pieces does she have now?

To find out, divide?

$$\frac{3}{4} \div \frac{1}{8} = \frac{3}{4} \times \frac{8}{1} = \frac{24}{4} = 6$$

Step 1 Write the reciprocal of the divisor. To write the reciprocal of a fraction, reverse the numerator and the denominator.

Step 2 Multiply.

Step 3 Write the quotient in the simplest form.

Paula has 6 pieces of ribbon.

Example: Rick is developing film in the darkroom. Each roll of film needs $\frac{1}{6}$ bottle of developer. If he has a bottle of developer that is $\frac{2}{3}$ full, how many rolls of film can he develop?

Divide $\frac{2}{3}$ by $\frac{1}{6}$.

$$\frac{2}{3} \div \frac{1}{6} = \frac{2}{3} \times \frac{6}{1} = \frac{12}{3} = 4$$
 Write the reciprocal of $\frac{1}{6}$. Then multiply.

CRITICAL THINKING

When you divide two fractions less than 1, will the quotient be greater than or less than either fraction? Explain your answer.

Exercise 16A

What is the reciprocal of each number?

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

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

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

4. $\frac{8}{7} =$

Exercise 16B

Divide. Write the quotient in simplest form.

5. $\frac{5}{6} \div \frac{4}{9} =$

6. $\frac{4}{5} \div \frac{1}{5} =$

7. $\frac{10}{9} \div \frac{4}{3} =$

8. $\frac{3}{5} \div \frac{2}{3} =$

9. $\frac{3}{8} \div \frac{3}{4} =$

10. $\frac{4}{5} \div \frac{1}{10} =$

11. $\frac{7}{10} \div \frac{1}{6} =$

12. $\frac{5}{8} \div \frac{1}{4} =$

13. $\frac{2}{9} \div \frac{4}{3} =$

14. $\frac{2}{5} \div \frac{5}{8} =$

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

16. $\frac{2}{3} \div \frac{2}{9} =$

17. $\frac{1}{2} \div \frac{7}{16} =$

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

19. $\frac{5}{6} \div \frac{7}{12} =$

20. $\frac{3}{8} \div \frac{3}{8} =$

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

22. $\frac{3}{4} \div \frac{3}{8} =$

WRITING IN MATH

Explain in your own words the relationship between multiplication and division of fractions. Why do you multiply when dividing fractions? How can the quotient be greater than both the dividend and the divisor? Give examples.

PART 17

Dividing with Mixed Numbers

David can design a company logo in $8\frac{1}{2}$ h. He works on the logo for $2\frac{1}{8}$ h each day. If he continues at this pace, how many days should it take him to complete the logo?

$$\begin{aligned} 8\frac{1}{2} \div 2\frac{1}{8} &= 17/2 \div 17/8 \\ &= 17/2 \times 8/17 \quad \text{The reciprocal of } 17/8 \text{ is } 8/17 \\ &= 136/34 = 4 \end{aligned}$$

Step 1 Write the mixed numbers as fractions.

Step 2 Write the reciprocal of the divisor.

Step 3 Multiply.

David will need 4 days to complete the logo.

Example: Divide: $9\frac{2}{5} \div \frac{1}{2}$

$$\begin{aligned} 5 \times 9 + 2: 9\frac{2}{5} &= 47/5 \div \frac{1}{2} \\ &= 47/5 \times 2/1 \text{ (the reciprocal of } \frac{1}{2} \text{ is } 2. \text{ Multiply.)} \\ &= 94/5 = 18\frac{4}{5} \text{ (Write the quotient in simplest form)} \end{aligned}$$

CRITICAL THINKING

When you divide two mixed numbers, will the quotient be greater than or less than either mixed number? Explain.

When you divide a mixed number by a fraction, will the quotient be greater than or less than the mixed number? Explain.

Exercise 17A

Write the mixed number as a fraction. Then write the reciprocal of the fraction.

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

2. $4\frac{4}{5} =$

3. $6\frac{2}{3} =$

4. $1\frac{3}{8} =$

5. $2\frac{1}{12} =$

6. $8\frac{1}{7} =$

Exercise 17B

Divide. Write the quotient in simplest form.

7. $3 \div 5\frac{1}{3} =$

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

9. $4 \div 1\frac{1}{2} =$

10. $3\frac{1}{2} \div \frac{7}{10} =$

11. $1\frac{3}{4} \div \frac{1}{2} =$

12. $2\frac{2}{5} \div 4 =$

$$13. 3 \frac{3}{4} \div 3 =$$

$$14. 1 \frac{1}{3} \div 12 =$$

$$15. 5 \frac{1}{4} \div 9 =$$

$$16. 3 \frac{3}{4} \div 2 \frac{1}{2} =$$

$$17. 8 \frac{1}{3} \div 3 \frac{1}{3} =$$

$$18. 1 \frac{3}{20} \div 1 \frac{4}{5} =$$

$$19. 20 \div 2 \frac{2}{3} =$$

$$20. 3 \frac{5}{9} \div 4 \frac{4}{9} =$$

$$21. 6 \frac{1}{2} \div 9 \frac{3}{4} =$$

$$22. 14 \div 5 \frac{1}{4} =$$

$$23. 7 \div 3 \frac{1}{9} =$$

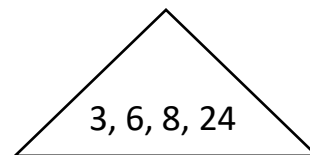
$$24. \frac{4}{5} \div 1 \frac{5}{7} =$$

CRITICAL THINKING

Use the numbers in the triangle to make the greatest possible quotient and the least possible quotient.

$$25. \underline{\quad} \div \underline{\quad}$$

$$26. \underline{\quad} \div \underline{\quad}$$



PART 18

Problem Solving Strategy: Choose the Correct Operation

Before you solve a problem, you need to make a plan. The plan tells which operation to use.

When the words in the problem suggest:

1. Joining or finding a total, add.
2. Finding how much greater one group is than another, subtract.
3. Joining sets with the same number, multiply.
4. Finding how many are in each group, divide.

Example: Betty worked 12 hours on Saturday. Maura worked $\frac{3}{4}$ of the time Betty worked. How many hours did Maura work?

The words of the time suggest multiplication.

$$12 \times \frac{3}{4} = 12/1 \times \frac{3}{4} = 36/4 = 9$$

Maura worked 9 hours.

Example: James has $3 \frac{1}{3}$ yd of rope. He cut it into pieces $\frac{1}{6}$ yd long. How many pieces of rope does he have?

$$\begin{aligned} 3 \frac{1}{3} \div \frac{1}{6} &= \frac{10}{3} \div \frac{1}{6} \\ &= \frac{10}{3} \times \frac{6}{1} \\ &= \frac{60}{3} = 20 \end{aligned}$$

James has 20 pieces of rope.

Exercise 18A

Tell which operation you used to solve each problem. Then solve.

1. Maria worked $6\frac{1}{2}$ hours on Monday. Neil worked $1\frac{1}{2}$ times as long. How many hours did Neil work?

2. Rachel rode her exercise bicycle $8\frac{1}{2}$ hours last week and 3 hours this week. How many hours did she ride during these two weeks?

3. Sandy's Gravel Company loaded $\frac{3}{8}$ T of gravel onto 2 trucks. What amount of gravel was loaded onto each truck?

4. Mr. Ramirez bought a roll of wire $\frac{5}{6}$ yd long. He cut it into pieces $\frac{1}{12}$ yd long. How many pieces of wire does he have now?

5. Mel put $\frac{1}{3}$ of his paycheck into his savings account. He used $\frac{1}{4}$ of his check to pay his rent. What fraction of his paycheck does he have left?

6. Robin had $\frac{2}{3}$ lb of potato salad left over from a cookout. She shared it equally among her 3 children. How much did each child receive?

7. Barbara worked $32\frac{1}{2}$ h last week and 40 h this week. How many more hours did she work this week than last week?

APPLICATION

Recipes

Fractions are used in cooking to indicate how much of each ingredient is needed for a given recipe. You may want to adjust the measures to make a larger or smaller quantity than the recipe calls for.

Solve.

1. David uses this recipe for molasses bread. He needs to make 1 loaf. How much of each ingredient does he need?

Molasses Bread	
2 eggs	3 tsp baking powder
2 c bran	1 $\frac{1}{4}$ tsp baking soda
2 c flour	$\frac{1}{2}$ c molasses
$\frac{1}{2}$ c sugar	2 c buttermilk
$\frac{1}{2}$ tsp salt	$\frac{1}{2}$ c oil
Makes 2 loaves	

2. Molly is making blueberry muffins. She needs 1 $\frac{1}{2}$ dozen muffins. How much of each ingredient does she need?

Blueberry Muffins	
$\frac{3}{4}$ c flour	1 c whole wheat flour
$\frac{1}{4}$ c sugar	1 c blueberries
$\frac{3}{4}$ tsp salt	$\frac{3}{4}$ c buttermilk
2 eggs	1 tsp baking powder
$\frac{1}{3}$ c salad oil	$\frac{1}{4}$ tsp baking soda
Makes 1 dozen muffins	

Module 8: Fractions in Real Life
Review 2

Multiply. Write the product in simplest form.

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

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

3. $\frac{3}{5} \times 7 =$

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

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

6. $\frac{1}{8} \times \frac{4}{5} =$

7. $\frac{3}{4} \times \frac{4}{7} =$

8. $\frac{7}{10} \times \frac{2}{5} =$

9. $\frac{7}{8} \times \frac{1}{4} =$

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

11. $1 \times 3\frac{4}{5} =$

12. $3\frac{2}{5} \times 1\frac{1}{2} =$

13. $8\frac{1}{3} \times 7 =$

14. $2\frac{1}{3} \times 3\frac{1}{3} =$

15. $\frac{6}{7} \times 4\frac{1}{8} =$

What is the reciprocal of each number?

16. $\frac{1}{3} =$

17. $\frac{4}{5} =$

18. $\frac{9}{10} =$

19. $\frac{11}{3} =$

20. $3 =$

21. $9 =$

22. $16 =$

23. $41 =$

Divide. Write the quotient in simplest form.

24. $1 \div 1/3 =$

25. $4 \div 1/5 =$

26. $6 \div 1/3 =$

27. $1/4 \div 8 =$

28. $3/8 \div 21 =$

29. $3/4 \div 9 =$

30. $1/2 \div 1/2 =$

31. $3/4 \div 1/3 =$

32. $3/5 \div 1/4 =$

33. $2/7 \div 2/3 =$

34. $4 \div 3 1/6 =$

35. $1 4/9 \div 8 2/3 =$