ED 023 884

08

VT 006 887

    This programed mathematics textbook is for student use in vocational education courses. It was developed as part of a programed series covering 21 mathematical competencies which were identified by university researchers through task analysis of several occupational clusters. The development of a sequential content structure was also based on these mathematics competencies. After completion of this program the student should be able to demonstrate (1) his recognition of fractions of the form a/b where a and b are letters or positive integers less than 100, (2) knowledge of the terms numerator and denominator, (3) how shaded areas of plane figures can be represented by fractions, (4) knowledge of the relationship between a ratio and a fraction, and (5) that competency has been attained by answering four out of five multiple choice test items covering each objective. The material is to be used by individual students under teacher supervision. Twenty-six other programed texts and an introductory volume are available as VT 006 882-VT 006 909, and VT 006 975. (EM)

FINAL REPORT
Project No. OE7-0031
Contract No. OEG-4-7-070031-1626
Report No. 16-D

Occupational Mathematics

RATIOS AND FRACTIONS

June 1968

U.S. DEPARTMENT OF
HEALTH, EDUCATION AND WELFARE

Office of Education
Bureau of Research

Uccupational Mathematics

RATIOS AND FRACTIONS

Project No. OE7-0031
Contract No. OEG-4-7-070031-1626
Report No. 16-D

by
Harold F. Rahmlow
Karl Ostheller
Clarence Potratz
Leonard T. Winchell
Arthur Snoey

June 1968

Washington State University, Department of Education, Pullman, Washington
State Coordinating Council for occupational Education, Olympia, Washington

OBJECTIVES

1. The student should be able to demonstrate his recognition of fractions of the form a/b where a and b are letters or positive integers less than 100.

2. The student should be able to demonstrate his knowledge of the terms numerator and denominator.

3. The student should be able to demonstrate how shaded areas of plane figures can be represented by fractions.

4. The student should be able to demonstrate his knowledge of the relationship between a ratio and a fraction.

5. The student should be able to demonstrate that he has attained competency in the four previously mentioned objectives by correctly answering 4 out of 5 multiple-choice test items covering each objective.

Greetings! You are about to begin improving your knowledge
of basic mathematics. There are many important uses for
the mathematics you are learning.

This booklet is not like your ordinary books. It is designed
to help you learn as an individual. On the following pages
you will find some information about mathematics. After
the information is presented, you will be asked a question.
Your answers to these questions will determine how you proceed
through this booklet. When you have selected your answer
to the question, turn to the page you are told to.

Do not write in this booklet. You may wish to have a pencil
and some paper handy so you can write when you want to.

Remember this is not an ordinary book.

1. Study the material on the page.

2. Read the question on the page (you may want to
    restudy the material on the page).

3. Select the answer you believe is correct.

4. Turn to the page indicated by your answer.

Are you ready to begin?

(a) Yes   Turn to page 1

(b) No   Turn to page C

(c) HELP   Go see your teacher

Your answer was (b) No.

Well, this booklet is a little different.

Go back and read page B again. After you have read it
you will probably be ready to begin.

You are already familiar with numbers such as 1, 2, 3, 4 and 5. These numbers are called integers. But integers alone are not enough to solve all problems. The ability to use fractions is also very important. Quantities like 2/5 and 1/3 are fractions.

Which of these is a fraction?

Your answer was either 16 or 3.6. No! The correct
answer was 1/2.

A fraction is a quantity of the form a/b. You read this
as "a divided by b." Both a and b must be integers. (You
recall that an integer is any whole number like 1, 10, 20
or 55.) The letter a can represent any integer. The letter
b can represent any integer except zero.

For example, 1/2, 3/4, 21/23, and 7/5 are all fractions.

Here's one for you to try.

Which of the following is a fraction?

Very good!   x = 4 and y = 7 is correct.

Here's one more.

If a = 3 and b = 5, then a/b = ?

Your answer was 3/5. Good! You're getting it. Let's go on.

One important use of fractions is illustrated by the follow-
ing question.
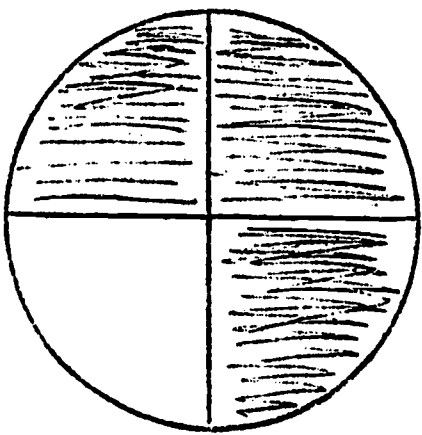
Look at the drawing on the left.
What fraction of the circle is
darkened?

(a) 2/3   Turn to page 25

(b) 3/4   Turn to page 16

(c) 4/3   Turn to page 15

(d) 1/4   Turn to page 24

Your last answer was incorrect. The correct answer was
3/5. It is very important to substitute correctly. Be
careful not to switch the a and b around. The numbers
must be put in exactly the same place as the letters
which represented them.

Now let's try again.

If a fraction 4/7 is represented by x/y, then

Your answer was 5. Good! Now, you're getting it.

Remember that a fraction is always in the form a/b,

where a and b are integers.

If a = 3 and b = 5, what numerical fraction is a/b?

Your last answer was 10.7 or neither. The correct

answer was 7/10. You still do not have the idea of a

fraction clear in your mind. A fraction must be of the

form a/b. Decimals are not of this form. 1/3, 1/4,

8/5 and 13/11 are all fractions.

Remember that a/b is the general form of any fraction.

In the fraction 1/3, a = 1 and b = 3.

In the fraction 13/11, a = 13 and b = 11.

Now you do one.

In the fraction 8/5, a = 8 and b = ?

Your last answer was incorrect. You seem to be having
difficulty understanding the relationship of numbers
and letters.

Go to the unit on substituting numbers and letters. Then
come back to page 1 of this unit.

Your last answer was incorrect. You seem to be having
difficulty understanding the relationship of numbers
and letters.

Go to the unit on substituting numbers and letters. Then
come back to page 1 of this unit.

Your last answer was incorrect. You seem to be having
difficulty understanding the relationship of numbers
and letters.

Go to the unit on substituting numbers and letters. Then
come back to page 1 of this unit.

Your answer was 1/2. Very good!

You recognized the fraction. Recall that we always need
two integers a and b to form a fraction. They are always
in the form a/b. We read this as "a divided by b."
Remember that b cannot be zero. You must never divide by
zero.

If a/b is a fraction and a = 3 and b = 5, what numerical
fraction is represented by a/b?

Your answer was 7/10. Good! Now, you're getting it.

Remember that a fraction is always in the form a/b,

where a and b are integers.

If a = 3 and b = 5, what numerical fraction is a/b?

You said you did not understand the last question.

The idea of substituting numbers for letters must be understood before going on.

Go take the unit on substitution. Then return to page 1 of this unit.

The correct answer on the last question should have been 5. You are having difficulty with the idea of a fraction.
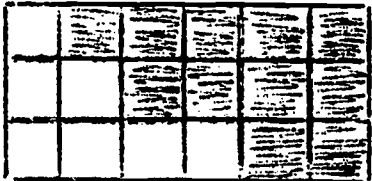
Go see your teacher for help. Then come back to the beginning of this unit.

Your answer was 4/3. The correct answer was 3/4.

Good! Your answer was 3/4. That is correct. Here is

another one like the last.

What fraction of the rectangle on
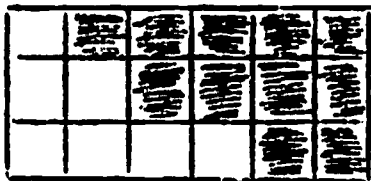
the left is shaded?

You seem to be having difficulty in this area.

Go tell your teacher you are having trouble with the section on shaded figures. Perhaps she can help you to understand.

Good! Your answer was 5/7. Now you're getting it.

Here is another one like the last.

What fraction of the rectangle

on the left is shaded?

Good! Your answer was 11/18. That is correct. Now, you understand how a simple diagram can represent a fraction.

You remember that a fraction is expressed in the form a/b, where a and b are integers. It is often important to talk about a or b separately.
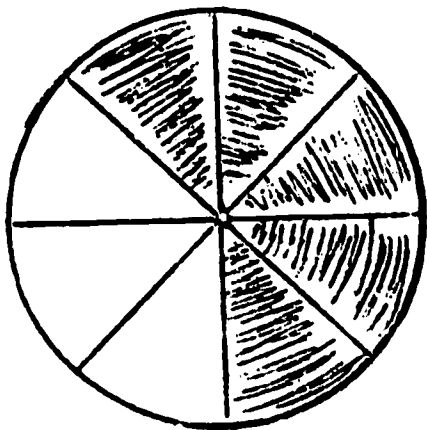
In any fraction a/b read "a divided by b," a is called the numerator. b is called the denominator. You should become familiar with these terms. The top number is always the numerator. The bottom number is always the denominator.

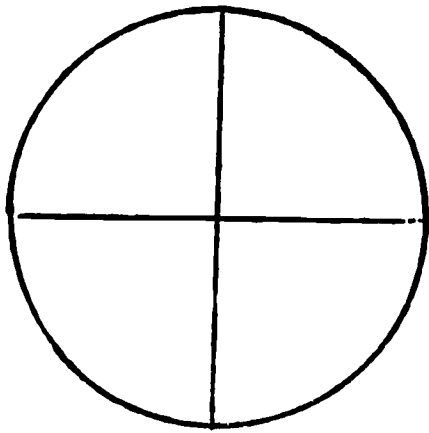In the fraction 3/4, 3 is the

Your answer was 7/18. Very good! Now, you're catching
on.

Maybe you'd better do one more just to be sure.

What fraction of the circle on
the left is shaded?

(a) 5/9

(b) 8/5

(c) 3/4

(d) 5/8

Let's see what is happening in this problem.

Look at the drawing.

You will notice that the circle is divided into fourths.

This means that there are four parts in the whole circle.

Also, every part is the same size.

In the circle below you can see that one of the four parts

has been darkened. This is the same as saying that 1/4
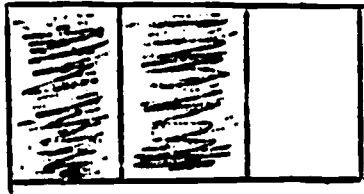
is the fraction of the circle that has been darkened.

By now you should be familiar with the general form of

a fraction a/b, where a and b are integers.
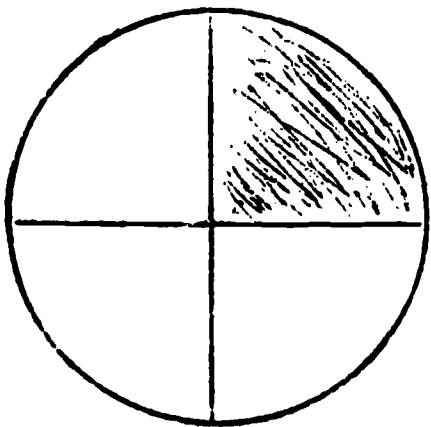
The <u>b</u> in the fraction tells how

many equal parts we cut the circle.

The <u>a</u> tells how many of these we
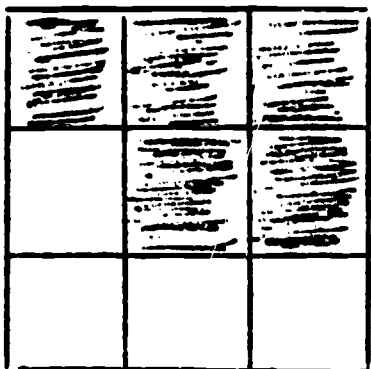
are talking about.

Let's look at one more.

What fraction of the rectangle

on the left is darkened?

You can see that the rectangle is divided into 3 equal

parts. So, b = 3. Also, 2 of these are darkened, so

a = 2.

Knowing these two things, a = 2 and b = 3, we say that

2/3 of the rectangle is darkened.

Here is another one.

The square on the left is divided into nine equal parts. Five of these nine parts are shaded. We can then say that the shaded part is 5/9 of the square.

Now you try one.
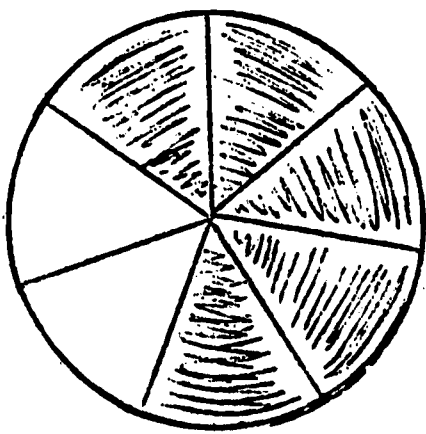
In the drawing, what fraction of the circle is shaded?

(a) 2/7   Turn to page 34

(b) 3/4   Turn to page 35

(c) 5/7   Turn to page 18

(d) 7/5   Turn to page 35

Your answer was 1/4.   The correct answer was 3/4.

Your answer was 2/3. The correct answer was 3/4.

Good! Your answer was 5/12. That is correct. Now, you
understand how a simple diagram can represent a fraction.

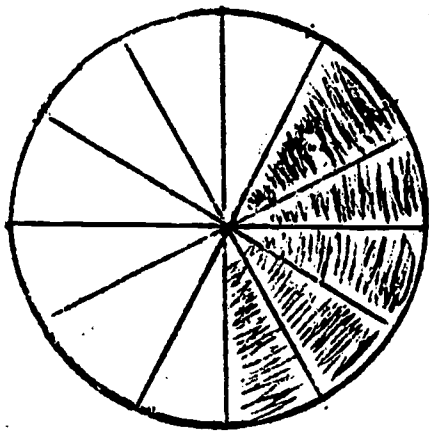You remember that a fraction is expressed in the form
a/b, where a and b are integers. It is often important
to talk about a or b separately.

In any fraction a/b read "a divided by b," a is called the
numerator. b is called the denominator. You should become
familiar with these terms. The top number is always the
numerator. The bottom number is always the denominator.

In the fraction 3/4, 3 is the

Fine! Your last answer of 5/9 was correct. I think
maybe you've got it now.

What fraction of the circle on

the left is shaded?

(a) 1/3

(b) 7/12

(c) 5/12

(d) I still don't see it
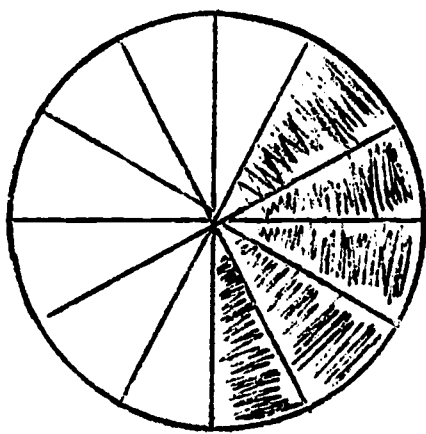
Fine! Your last answer of 5/8 was correct. I think
you've got it now.

What fraction of the circle on

the left is shaded?

(a) 1/3 Turn to page 33

(b) 7/12 Turn to page 17

(c) 5/12 Turn to page 26

(d) I still don't see it
Turn to page 17

Good! Your answer was 5/8. That is correct. Now you

understand how a simple diagram can represent a fraction.

You remember that a fraction is expressed in the form

a/b, where a and b are integers. It is often important

to talk about a or b separately.

In any fraction a/b read "a divided by b," a is called the

numerator. b is called the denominator. You should become

familiar with these terms. The top number is always the

numerator. The bottom number is always the denominator.

In the fraction 3/4, 3 is the

Your last answer was 7/18 or you didn't understand. The correct answer was 11/18. Let's see the correct way to do it.
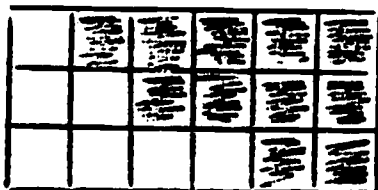
Count the total number of equal parts inside the rectangle. There are 18. So, the denominator of our fraction is 18.

How many of those 18 are shaded? Count them. You should have counted 11. So, 11 is the numerator.

Then, we say that 11/18 of the rectangle is shaded.

Here's another one for you to do.
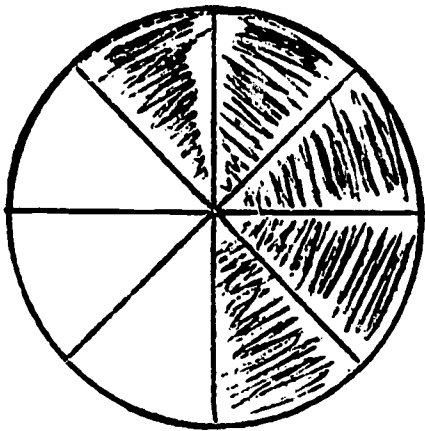
What fraction of the circle on the left is shaded?

Your last answer was 5/9. No! The correct answer was 5/8.

Let's look at it again. Remember that the denominator always tells how many equal parts there are in the total. In this problem there should be 8. Count them.

How many of the total parts are shaded? There are 5 parts shaded.

Then, we simply say that 5/8 of the entire circle is shaded.

Did that help you any? Here's another one.

What fraction of the square on the left is shaded?

(a) 5/9

(b) 4/9

(c) 1/2

(d) I just don't get it

Your last answer was 1/2. The correct answer was 11/18.
Let's see the correct way to do it.

Count the total number of equal
parts inside the rectangle. There
are 18. So, the denominator of
our fraction is 18.

How many of those 18 are shaded? Count them. You should
have counted 11. So, 11 is the numerator.
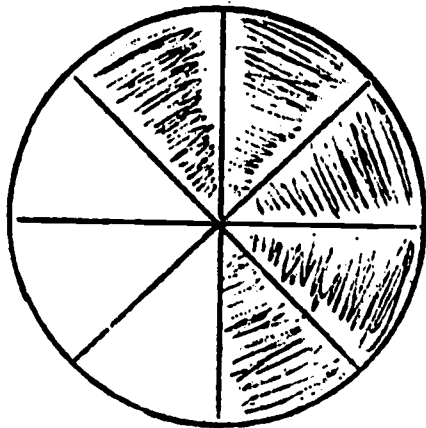
Then, we say that 11/18 of the rectangle is shaded.

Here's another one for you to do.

What fraction of the circle on
the left is shaded?

You seem to be having difficulty in this area.

Go tell your teacher you are having trouble with the
section on shaded figures. Perhaps she can help you
to understand.

Your answer was 2/7. The correct answer was 5/7.
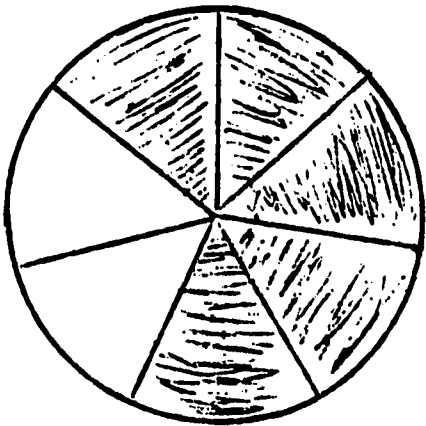
Let's see why 5/7 is the right answer.

Count the number of parts in the circle. You should have counted 7 parts. Now, count the number of shaded parts. You should have counted 5 shaded parts.

There are 7 equal parts, and 5 of them are shaded. Then, we say 5/7 of the circle is shaded.

It's really not so hard, is it?

Here is one more.

What fraction of the rectangle on the left is shaded?

(a) 1/3   Turn to page 17

(b) 11/18   Turn to page 33

(c) 7/18   Turn to page 20

(d) I don't understand how to tell
                Turn to page 33

Your answer was 3/4 or 7/5. The correct answer was 5/7.
Let's see why 5/7 is the right answer.

Count the number of parts in the
circle. You should have counted
7 parts. Now, count the number of
shaded parts. You should have
counted 5 shaded parts.

There are 7 equal parts, and 5 of them are shaded. Then,
we say 5/7 of the circle is shaded.

It's really not so hard, is it?

Here is one more.
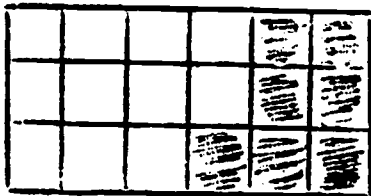
What fraction of the rectangle
on the left is shaded?

(a) 1/3   Turn to page 17

(b) 11/18   Turn to page 33

(c) 7/18   Turn to page 20

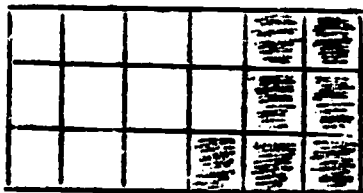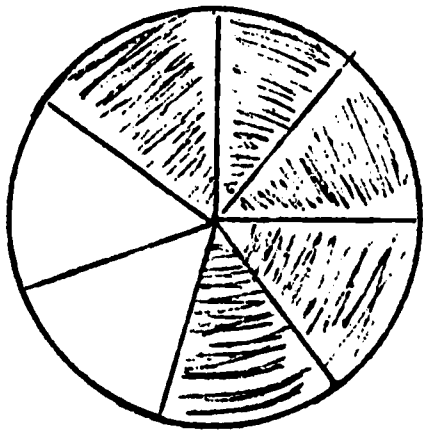(d) I don't understand how to tell
                Turn to page 33

Your answer was 8/5 or 3/4. No! The correct answer
was 5/8.
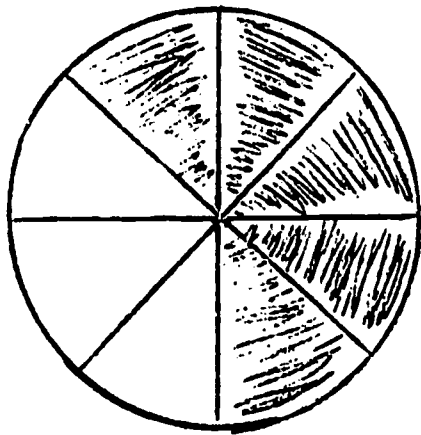
Let's look at it again. Remember
that the denominator always tells
how many equal parts there are in
the total. In this problem there
should be 8. Count them.

How many of the total parts are shaded? There are 5
parts shaded.

Then, we simply say that 5/8 of the entire circle is shaded.

Did that help you any? Here's another one.
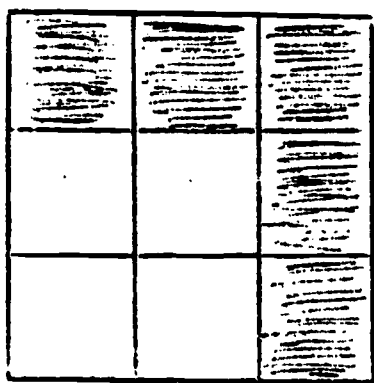
What fraction of the square on
the left is shaded?

(a) 5/9   Turn to page 27

(b) 4/9   Turn to page 33

(c) 1/2   Turn to page 17

(d) I just don't get it
             Turn to page 33

Your last answer of 13 was not correct. In 13/15, the
13 is on top. So, it must be the numerator.

What is the denominator of k/x?

You said that in the fraction 3/13, 13 is the numerator
and 3 is the denominator. That is not correct.

Always remember:

    Numerator - - - - - top

    Denominator - - - - - bottom

Say that over in your mind several times before going on.

It's really not hard at all.

In any fraction the denominator is on the _____,
while the numerator is on the _____.

In the fraction 3/4, 3 is the numerator.

In any fraction the top number is always called the
numerator. The bottom number is always called the
denominator.

So, in the fraction 3/4, 3 is the top and 4 is the bottom.

Therefore, 3 is the numerator. 4 would be the denominator.

As another example take the fraction 5/17. Here 5 is the
numerator. 17 is the denominator.

In the fraction 3/13

    (a) 3 is the numerator and 13 is the denominator

    (b) 13 is the numerator and 3 is the denominator

You're making it too hard. But these words are very
important. They must be learned.

Go ask your teacher to explain numerator and denominator.

No! The denominator of 7/15 is 15. Remember, the bottom

is the denominator.

What is the numerator of x/3?

The correct answer to the last problem was x. Remember that the numerator in any fraction is always on top. The denominator is on the bottom.

They do not always have to be a number. They can be letters which represent numbers.

What is the denominator of E/R?

Good!   R is the denominator.

Which (numerator or denominator) always goes on the top

of a fraction?

The correct answer to the last problem was **x**. Remember that the numerator in any fraction is always on top. The denominator is on the bottom.

They do not always have to be a number. They can be letters which represent numbers.

What is the denominator of E/R?

You're doing fine. Your last answer was correct. Here
is one more.

What is the denominator of the fraction 7/15?

Good! x is the numerator of x/3. The numerators and denominators can be letters as well as numbers. The letters just represent numbers.

What is the denominator of 13/15?

    (a) 13

    (b) 15

Your last answer was correct. Very good! Be sure to
continue using the terms numerator and denominator when
talking about fractions. They are important words to
remember.

The idea of a ratio is almost
the same as the idea of a fraction.
For example, consider the figure
on the left. We can say that the
ratio of the shaded area to the
whole area is 2 to 3 or 2/3.

Another example would be that the
ratio of the shaded area to the
white area is 2 to 1 or 2/1.

In any ratio the first number always corresponds to the
numerator of the fraction. The second number corresponds to
the denominator.

What fraction represents the ratio 3 to 7?

Your last answer was correct. Very good! Be sure to continue using the terms numerator and denominator when talking about fractions. They are important words to remember.

The idea of a ratio is almost the same as the idea of a fraction. For example, consider the figure on the left. We can say that the ratio of the shaded area to the whole area is 2 to 3 or 2/3.

Another example would be that the ratio of the shaded area to the white area is 2 to 1 or 2/1.

In any ratio the first number always corresponds to the numerator of the fraction. The second number corresponds to the denominator.

What fraction represents the ratio 3 to 7?

No! Both 9/2 and 9 to 2 are incorrect. In fact, these
answers both mean the same thing. The correct answer was
2 to 9.

The fraction 2/9 expresses the ratio 2 to 9.

It's really quite simple. Just remember:

    First number - - - - - numerator

    Second number - - - - - denominator

Try another one and see if you can get it.

What fraction is the same as the ratio 7 to 8?

    (a) 7/8   Turn to page 53

    (b) 8/7   Turn to page 56

    (c) Don't know   Turn to page 62

Very good! You have now shown that you understand the ideas of this unit. Let's review what we've done.

I.   A fraction is a quantity of the form a/b, where a and b are integers. b cannot be zero.

II. The top term in the fraction a/b is always called the numerator. The bottom term in the fraction a/b is always called the denominator.

III. The idea of ratio is the same as the idea of fraction. The ratio of any two numbers x and y can be expressed in the fractional form x/y.

Now that you understand ratio, we can use it to say that a fraction is the ratio of two integers a and b, where b is not zero.

Now, you should be ready for a quiz over this unit. If you need to review, refer to the following pages.

Go tell your teacher you have finished the unit.

Your answer was 3/7. You're doing very well.

Here's another one.

The fraction 2/9 expresses the ratio

Your answer to the last one was incorrect.

Let's try again. The fraction that represents the ratio 3 to 7 is 3/7.

The first number of the ratio is the numerator of the fraction. The second number is the denominator.

In our problem, for the ratio 3 to 7, the 3 is first and the 7 is second. Then, the fraction must be 3/7.

Remember that the ratio 5 to 9 is the same as the fraction 5/9.

What fraction is the same as the ratio 11 to 3?

Good! I think you might have it. Let's try one more
just to be sure.

What fraction represents the ratio 33 to 17?

The fraction that represents the ratio 3 to 7 is 3/7.

The first number of the ratio is the numerator of the fraction. The second number is the denominator.

In our problem, for the ratio 3 to 7, the 3 is first and the 7 is second. Then, the fraction must be 3/7.

Remember that the ratio 5 to 9 is the same as the fraction 5/9.

What fraction is the same as the ratio 11 to 3?

No! The correct answer to the last problem was 11/3.
Let's see why this is true.

In the ratio 11 to 3, 11 is the first number. So, it
<u>must</u> be the numerator of the fraction. 3 is the second
number. So, it <u>must</u> be the denominator. That makes the
fraction 11/3.

Always use the same numbers that are given. Read
carefully. Do not switch the order.

Remember that ratio and fraction are really two terms
expressing the same relationship. For example, the ratio
3 to 2 is the same as the fraction 3/2. The fraction 1/8
represents the ratio 1 to 8. Every fraction is really a
ratio.

Here's another one for you to try.

The ratio 2 to 5 can be expressed by the fraction:

No! 7/8 is the fraction that represents the ratio

7 to 8.

The numerator 7 must be the same as the first number in

the ratio. The denominator 8 must be the same as the

second number in the ratio.

> 7 - - - - - first number - - - - - numerator
>
> 8 - - - - - second number - - -- - - denominator

The ratio 3 to 2 is the same as the fraction

Excellent! 3/2 is correct.

Here's one more.

4/7 is the same as _____ to _____.

No!   You are having trouble understanding what a ratio
is.

Go see your teacher for help in this area.

Then, return to page 47.

No! You are having trouble understanding what a ratio
is.

Go see your teacher for help in this area.

Your answer was 2/5. Correct!

What fraction is the same as the ratio 7 to 8?

Darn! You almost had it. Let's review the rule.

First number in ratio - - - - - numerator.

Second number in ratio - - - - - denominator.

The fraction 7/10 is the same as the ratio

You said you didn't know.

The numerator 7 must be the same as the first number in the ratio. The denominator 8 must be the same as the second number in the ratio.

7 - - - - - first number - - - - - numerator

8 - - - - - second number - - - - - denominator

The ratio 3 to 2 is the same as the fraction

(a) 3/2

(b) 2/3

(c) I still don't get it

Your answer was 11/3. You're starting to catch on.

Here's another one.

The fraction 2/9 expresses the ratio

Darn! You almost had it. Let's review the rule.

First number in ratio - - - - - numerator.

Second number in ratio - - - - - denominator.

The fraction 7/10 is the same as the ratio

TEST QUESTIONS

UNIT 4 - FRACTION AND RATIO

Directions: The correct answers will always be expressed in lowest terms.

1. Is k/13 a fraction?

   (a) Yes

   (b) No

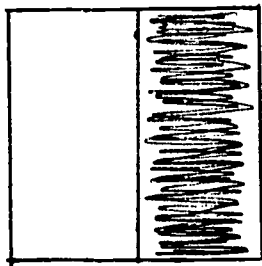2. 4/5 expresses the ratio

   (a) 5 to 4

   (b) 4:2:5

   (c) 4 to 5

3. The numerator of 5/8 is

   (a) 5

   (b) 8

   (c) The line /.

4. What fraction of the square is shaded?

   (a) 1/3

   (b) 1/2

   (c) 1/4

   (d) 2/5

5. Which of the following is a fraction?

   (a) 3

   (b) 13

   (c) 2/85

   .(d) 1.7

6. How would you express the ratio 7 to 10?

   (a) 7/10

   (b) 7:2:10

   (c) 7 . 10

   (d) 10/7

7. The bottom number in a fraction is called the _____.

   (a) indicator

   (b) numerator

   (c) demonstrator

   (d) denominator

8. How much of the rectangle is shaded?
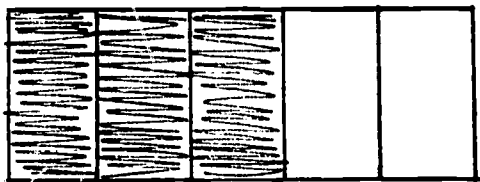
   (a) 3/2

   (b) 2/3

   (c) 2/5

   (d) 3/5

9. We have defined a fraction as a/b. If a = 15 and b = 9, what numerical fraction is a/b?

   (a) 9/15

   (b) 15/9

   (c) a/b

10. The fraction of 15/8 expresses the ratio of

   (a) 15 to 8

   (b) 8 to 15

   (c) 30 to 17

11. If the denominator of a fraction is x and the numerator is y, the the fraction is

   (a) y/x

   (b) x/y

   (c) a/b

   (d) 1/2

12. The shaded area represents what fraction of the whole circle?
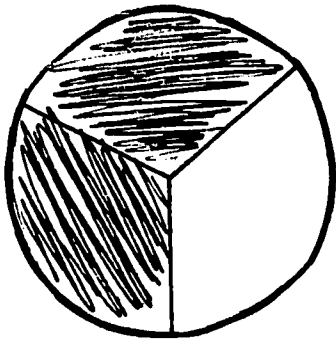
   (a) 1/3

   (b) 3/4

   (c) 2/3

   (d) 3/3

13. Which of the following are fractions?

   (1) 7/10, (2) 15, (3) 6.9, (4) x/y, (5) 2/5

   (a) 2 and 5

   (b) 3

   (c) 2, 3, and 4

   (c) 1, 4, and 5

14. What is the ratio of the length of stick A to stick B?

   (a) 1/2

   (b) 1

   (c) 2/1

   (d) 2:2:1

15. In the fraction 11/17,

    (a) 17 is the numerator and 11 the denominator

    (b) 11 and 17 are both numerators

    (c) 11 is the numerator and 17 the denominator

    (d) 11 and 17 are both denominators

16. The shaded area is what fraction of the square?
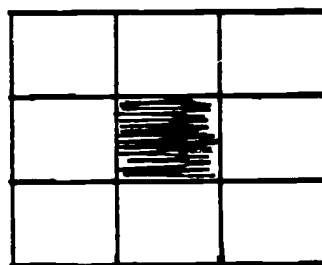
    (a) 1/10

    (b) 2/17

    (c) 1/9

    (d) 9/1

17. Which of the following is not an acceptable fraction?

    (a) 2/9

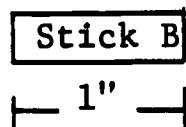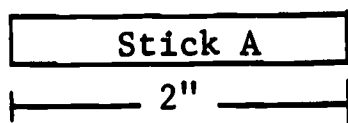   (b) 3/7

    (c) 3/2

    (d) 5/0

18. If you have 10 coins and 7 of them are pennies, what is the ratio of pennies to the total number of coins you have?

    (a) 7/10

    (b) 3/10

    (c) 3/7

    (d) 7/3

19. In the fraction 3k/13 the numerator is

    (a) 3

    (b) 13

    (c) 3k

    (d) k

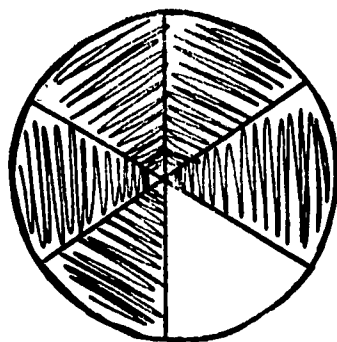20. What fraction of the circle is <u>not</u> shaded?

    (a) 1/7

    (b) 1/6

    (c) 1/8

    (d) 5/6

Answer Sheet – Unit 4

1. a (Yes)

2. c (4 to 5)

3. a (5)

4. b (1/2)

5. c (2/85)

6. a (7/10)

7. d (denominator)

8. d (3/5)

9. b (15/9)

10. a (15 to 8)

11. a (y/x)

12. c (2/3)

13. d (7/10, x/y, 2/5)

14. c (2/1)

15. c (11-numerator & 17-denominator)

16. c (1/9)

17. d (5/0)

18. a (7/10)

19. c (3k)

20. b (1/6)

TO THE INSTRUCTOR: The above problems are related to the objectives of

unit as follows:

Objective	Problems
1	1, 5, 9, 13, 17
2	2, 6, 10, 14, 18
3	3, 7, 11, 15, 19
4	4, 8, 12, 16, 20

ERIC ACCESSION NO.					
CLEARINGHOUSE ACCESSION NUMBER	RESUME DATE June 1968	P.A.	T.A.	IS DOCUMENT COPYRIGHTED? YES ☐ NO ☒ ERIC REPRODUCTION RELEASE? YES ☒ NO ☐	

TITLE

Occupational Mathematics - FRACTION AND RATIO

PERSONAL AUTHORS

Rahmlow, Harold; Ostheller, Karl; Potratz, Clarence; Winchell, L.; Snoey, Arthur

INSTITUTION SOURCE	SOURCE CODE
Washington State University, Pullman, Washington, Dept. of Education	

REPORT/SERIES NO. Final Report No. 16-D

OTHER SOURCE	SOURCE CODE

OTHER REPORT NO.

OTHER SOURCE	SOURCE CODE

OTHER REPORT NO.

PUBL. DATE June 1968 --	CONTRACT GRANT NUMBER OEG-4-7-070031-1626

PAGINATION ETC.

68 pages

RETRIEVAL TERMS

Occupational mathematics
Programmed instruction
Fractions and ratios

IDENTIFIERS

Vo-Tech. Education Research and Development Project (no. 7-0031)

ABSTRACT

One book of a 21-book series of programmed instruction materials designed to help pupils acquire mathematics capabilities most useful in sub-professional level occupations. Other programmed books in the series are:

Symbols	Division of Decimals
Representing Numbers by Letters	Conversion of Fractions into Decimals
Equivalent Forms	Equivalent Forms of A = BC
Addition of Fractions	Solutions of A = BC
Subtraction of Fractions	Percentage
Multiplication of Fractions	Commutative Law
Division of Fractions	Reciprocals
Concepts of Decimals and Fractions	Scientific Notation
Addition and Subtraction of Decimals	Proportions
Multiplication of Decimals	Concepts of Number Bases