

MULTIPLYING AND DIVIDING FRACTIONS 9

Name: Key Date: _____ Period: _____

SECTION 9.3 FRACTIONS, DECIMALS & PERCENT EQUIVALENTS

VOCABULARY

DEFINITION	EXAMPLE
<p>Percent: <i>A number "in a hundred," which is equivalent to a decimal or fraction with 100 as a denominator.</i></p>	<p><i>$\frac{75}{100} = 0.75 = 75\%$</i></p>

Big Idea: How do we compare, convert, and order fractions, decimals, and percents?

What are two other ways to represent fractional amounts?

decimals and percents

FRACTION TO DECIMAL

How do you change a fraction into a decimal?

divide the numerator by the denominator to find the quotient.

EXPLORATION 1

Convert the following fractions to decimal form. You may verify your answer by dividing with a calculator, if necessary.

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

0.25, 0.5, 0.75

b. $\frac{1}{5}, \frac{2}{5}, \frac{3}{5}, \frac{4}{5}$

0.2, 0.4, 0.6, 0.8

c. $\frac{1}{8}, \frac{2}{8}, \frac{3}{8}, \frac{5}{8}$

$0.125, 0.25, 0.375, 0.625$

d. $\frac{1}{3}, \frac{1}{9}, \frac{1}{90}, \frac{1}{30}$

$0.\bar{3}, 0.\bar{1}, 0.0\bar{1}, 0.0\bar{3}$

PROBLEM 1

Convert the following fractions to decimal form by using equivalent fractions:

a. $\frac{4}{5} = \frac{40}{50} = \frac{80}{100}$

0.8

b. $\frac{11}{20} = \frac{55}{100}$

0.55

c. $\frac{49}{50} = \frac{98}{100}$

0.98

d. $\frac{3}{40} = \frac{3 \cdot 25}{40 \cdot 25} = \frac{75}{1000}$

0.075

e. $\frac{377}{500} = \frac{377 \cdot 2}{500 \cdot 2} = \frac{754}{1000}$

0.754

What if your fraction does not evenly divide into 100?

(Answers may vary) Use division to find the decimal.

FRACTION TO PERCENT

What does the word *percent* mean?

"in a hundred"

EXPLORATION 2

It is useful to convert some fractions into decimal form by finding the equivalent fraction with the denominator of 100. In converting decimals to percents, you can multiply the decimal by 100 to get the percent. For instance $(0.75)(100) = 75\%$. We illustrate this using the chart below. Test your skills by completing it.

Fraction	Fraction in Hundredths	Decimal	Percent
$\frac{3}{4}$	$\frac{75}{100}$	0.75	$(0.75)(100) = 75\%$
$\frac{12}{25}$	$\frac{48}{100}$	0.48	$(0.48)(100) = 48\%$
$\frac{7}{10}$	$\frac{70}{100}$	0.7	70%
$\frac{1}{20}$	$\frac{5}{100}$	0.05	5%
$\frac{5}{8} \cdot \frac{12.5}{12.5}$	$\frac{62.5}{100}$	0.625	62.5%

PERCENT TO FRACTION

How can you change a percentage to a fraction (hint: use the definition of percent)?

Divide by 100 / use 100 as the denominator.

DECIMAL TO PERCENT

How can you change a decimal to a percent?

Multiply by 100.

	Fraction	Decimal	Percent
	$\frac{1}{100}$	0.01	1%
$\frac{12.5}{100} = \frac{125}{1000} = \frac{5 \cdot 25}{5 \cdot 200} = \frac{1}{8}$		0.125	12.5%
$\frac{0.25}{100} = \frac{25}{10000} = \frac{1}{400}$		0.0025	0.25%
$\frac{24.5}{100} = \frac{245}{1000} = \frac{5 \cdot 49}{5 \cdot 200} = \frac{49}{200}$		0.245	$24\frac{1}{2}\%$

PERCENT TO DECIMAL

How can you change a percent into a decimal?

Divide by 100, which results in shifting the decimal place.

DECIMAL TO FRACTION

How can you change a decimal into a fraction?

Write the decimal as a fraction over a power of 10 (place value). (students may choose to use 100 as the denominator.)
Simplify.

EXAMPLE 1

How do you convert a fraction like $\frac{5}{16}$ into a decimal and a percent?

$$5 \div 16 = 0.3125$$

$$31.25\%$$

PROBLEM 2

Convert each of the following fractions to a decimal and a percent:

a. $\frac{4}{21}$

$= 4 \div 21$

$= 0.190476$

$= 19.047619\%$

b. $\frac{9}{32}$

$= 9 \div 32$

$= 0.29125$

$= 29.125\%$

c. $\frac{5}{6}$

$= 5 \div 6$

$= 0.8\bar{3}$

$= 83.\bar{3}\%$

$= 83\frac{1}{3}\%$

EXAMPLE 2

A class of 25 students has 12 girls. What percent of the class are girls?

$$\frac{12}{25} = \frac{48}{100} = 48\%$$

PROBLEM 3

Amy was shooting hoops in her backyard. She made 9 of 15 baskets. What percent of her shots did she make?

$$\frac{9}{15} = \frac{3}{5} = .6 = 60\%$$

PROBLEM 4

In a small bag of 32 pieces of mixed candy, there are 4 pieces of lemon candy. What percent is lemon?

$$\frac{4}{32} = \frac{1}{8} = 0.125 \quad 12.5\%$$

EXPLORATION 3: Linear Model Fractions Activity

Fill in the linear model fraction activity sheet located at the end of workbook section 9.3. Label the separate divisions for fractions as well as for decimals. For example, label the divisions for fourths as $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, and $\frac{4}{4}$

Describe the three methods for comparing and ordering fractions. *Answers may vary slightly*

1. Linear Model

Which fraction is farther on the number line?

2. Area Model

Which fraction shades more area?

3. Conversion to decimal

Which decimal is greater?

EXAMPLE 3

Sara has a 16-ounce cup that has ten ounces of water in it. Mary has a 12-ounce cup that has eight ounces of water in it.

- a. They look about equal. Are they? Which cup is fuller? Explain.

Sara: $\frac{10}{16} = \frac{5}{8} = 62.5\%$

Mary's cup is fuller.

Mary: $\frac{8}{12} = \frac{2}{3} = 66.\overline{6}\%$

- b. Sara and Mary each drink three ounces of water from their glasses. Which cup is fuller now? Explain.

Sara: $10 - 3 = 7$ $\frac{7}{16} = 0.4375$ or 43.75%

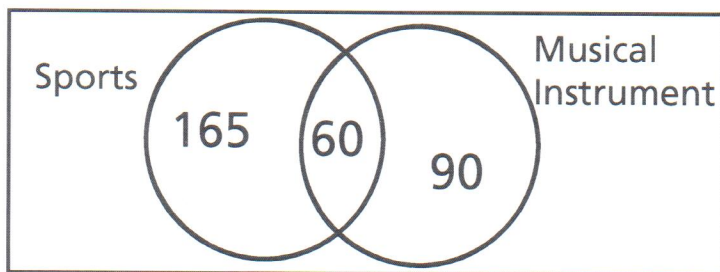
Sara's cup is fuller now.

Mary: $8 - 3 = 5$ $\frac{5}{12} = 0.41\overline{6}$ or $41.\overline{6}\%$

PROBLEM 5

Finding percents from picture models.

All 750 students at Miller Middle School in San Marcos were asked whether they played a musical instrument and whether they played on a sports team at the school. The Venn diagram shows the results of the survey.



- a. What percent of the students played a musical instrument?

$$\frac{90+60}{750} = \frac{150}{750} = \frac{1}{5} = .2 = \boxed{20\%}$$

- b. What percent of the students played on a sports team?

$$\frac{165+60}{750} = \frac{225}{750} = \frac{3}{10} = 0.3 = \boxed{30\%}$$

- c. What percent of the students played a musical instrument and played on a sports team?

$$\frac{60}{750} = \frac{2}{25} = 0.08 = \boxed{8\%}$$

- d. What percent did neither?

$$750 - 165 - 60 - 90 = 435$$

$$\frac{435}{750} = \frac{29}{50} = 0.58 = \boxed{58\%}$$

PRACTICE EXERCISES

Fill in the missing fractions, decimals, and percents. Round decimals to the thousandths.

Fraction	Decimal	Percent
$\frac{65}{100} = \frac{13}{20}$	0.65	65%
$\frac{9}{15}$	0.6	60%
$\frac{64}{100} = \frac{16}{25}$	0.64	64%
$\frac{7}{8}$	0.875	87.5%
$\frac{726}{1000} = \frac{363}{500}$	0.726	72.6%
$\frac{5}{1000} = \frac{1}{200}$	0.005	0.5%
$\frac{145}{100} = \frac{29}{20}$	1.45	145%
$\frac{320}{100} = \frac{16}{5}$	3.2	320%
$\frac{8}{1000} = \frac{1}{125}$	0.008	0.8%

SUMMARY (What I learned today)
