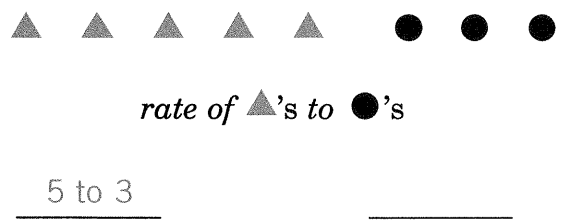
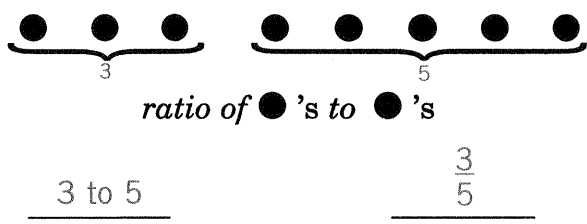


Lesson 1 Ratio

A ratio is a comparison of the numbers of two sets of like objects.

A rate is a comparison of the numbers of two sets of different objects.



Express the ratio or the rate of the number of items in the first set to the number of items in the second set in two ways as shown.

		<i>a</i>	<i>b</i>
1. {○, □}	{*, Δ, □}	2 to 3 _____	$\frac{2}{3}$ _____
2. {Jim, John}	{Jo, Sue, Ann, Kay}	_____	_____
3. {1, 2, 3, 4}	{ <i>a</i> , <i>b</i> , <i>c</i> }	_____	_____
4. {Bob, Dick, Al}	{1st, 2nd, 3rd}	_____	_____
5. { <i>m</i> , <i>n</i> , <i>o</i> , <i>p</i> , <i>q</i> }	{ <i>w</i> , <i>x</i> , <i>y</i> , <i>z</i> }	_____	_____

Express each of the following as a ratio or a rate in two ways as shown.

	<i>a</i>	<i>b</i>
6. 7 runs in 9 innings	7 to 9 _____	$\frac{7}{9}$ _____
7. 5 boys to 6 girls	_____	_____
8. 3 teachers for 72 students	_____	_____
9. 5 pages in 20 minutes	_____	_____
10. 5 touchdowns in 4 games	_____	_____
11. 11 chairs to 2 tables	_____	_____
12. 6 goals for 9 shots	_____	_____

Lesson 2 Proportions (recognizing)

A proportion expresses the equality of two ratios.

$\frac{2}{3} = \frac{4}{6}$ is a proportion because $2 \times 6 = 3 \times 4$ is true.

$\frac{5}{8} = \frac{3}{4}$ is not a proportion because $5 \times 4 = 8 \times 3$ is false.

$\frac{4}{5} = \frac{7}{8}$ _____ a proportion because $4 \times 8 = 5 \times 7$ is _____.

$\frac{3}{4} = \frac{9}{12}$ _____ a proportion because $3 \times 12 = 4 \times 9$ is _____.

Circle each proportion below.

- | <i>a</i> | <i>b</i> |
|--------------------------------------|----------------------------------|
| 1. $\frac{2}{3} = \frac{8}{12}$ | $\frac{1}{4} = \frac{2}{9}$ |
| 2. $\frac{5}{8} = \frac{11}{16}$ | $\frac{5}{6} = \frac{20}{24}$ |
| 3. $\frac{1}{6} = \frac{2}{12}$ | $\frac{14}{16} = \frac{7}{8}$ |
| 4. $\frac{5}{12} = \frac{15}{36}$ | $\frac{8}{3} = \frac{15}{6}$ |
| 5. $\frac{7}{20} = \frac{15}{40}$ | $\frac{9}{24} = \frac{1}{3}$ |
| 6. $\frac{1}{3} = \frac{6}{18}$ | $\frac{15}{24} = \frac{5}{8}$ |
| 7. $\frac{7}{12} = \frac{9}{16}$ | $\frac{4}{5} = \frac{10}{12}$ |
| 8. $\frac{9}{10} = \frac{90}{100}$ | $\frac{8}{10} = \frac{4}{5}$ |
| 9. $\frac{4}{12} = \frac{5}{16}$ | $\frac{4}{3} = \frac{5}{4}$ |
| 10. $\frac{12}{25} = \frac{48}{100}$ | $\frac{125}{1000} = \frac{1}{8}$ |

Lesson 3 Proportions PRE-ALGEBRA

Study how the proportions below are solved.

$\frac{5}{8} = \frac{15}{n}$ $5 \times n = 8 \times 15$ $5n = 120$ $n = \underline{24}$	$\frac{2}{3} = \frac{n}{24}$ $2 \times 24 = 3 \times n$ $48 = 3n$ $\underline{\quad\quad} = n$	$\frac{5}{n} = \frac{6}{24}$ $5 \times 24 = n \times 6$ $120 = 6n$ $\underline{\quad\quad} = n$	$\frac{n}{6} = \frac{20}{24}$ $n \times 24 = 6 \times 20$ $24n = 120$ $n = \underline{\quad\quad}$
---	--	---	--

Solve each of the following.

a

1. $\frac{2}{3} = \frac{n}{18}$

b

$\frac{3}{5} = \frac{n}{25}$

c

$\frac{3}{4} = \frac{n}{100}$

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

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

$\frac{7}{8} = \frac{42}{n}$

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

$\frac{n}{8} = \frac{21}{24}$

$\frac{n}{3} = \frac{24}{36}$

4. $\frac{8}{n} = \frac{1}{2}$

$\frac{5}{n} = \frac{20}{28}$

$\frac{4}{n} = \frac{80}{100}$

5. $\frac{n}{2} = \frac{12}{8}$

$\frac{5}{8} = \frac{n}{1000}$

$\frac{3}{4} = \frac{36}{n}$

Lesson 4 Proportions PRE-ALGEBRA

A train can travel 120 km in 2 h. At that rate, how far can the train travel in 3 hours?

Let n represent the number of kilometres travelled in 3 h. Then the following proportions can be obtained by thinking as follows.

Compare the number of hours to the number of kilometres travelled.

$$\frac{2}{120} = \frac{3}{n}$$

$$2n = 360$$

$$n = \underline{\hspace{2cm}}$$

Compare the number of kilometres travelled to the number of hours.

$$\frac{120}{2} = \frac{n}{3}$$

$$360 = 2n$$

$$\underline{\hspace{2cm}} = n$$

Compare the first number of hours to the second and the first number of kilometres to the second.

$$\frac{2}{3} = \frac{120}{n}$$

$$2n = 360$$

$$n = \underline{\hspace{2cm}}$$

Compare the second number of hours to the first and the second number of kilometres to the first.

$$\frac{3}{2} = \frac{n}{120}$$

$$360 = 2n$$

$$\underline{\hspace{2cm}} = n$$

Use a proportion to solve each problem.

1. If eight cases of merchandise cost \$60, what would 12 cases cost?

12 cases would cost \$_____.

2. 2 kg of apples can be purchased for 98¢. At this rate, what would 1 kg of apples cost?

1 kg of apples would cost _____¢.

3. Caitlin delivered 450 flyers in 3 h. At this rate, how many flyers can she deliver in 4 h?

She can deliver _____ flyers in 4 h.

4. In his last game the Rams' quarterback threw 18 passes and completed 10. At this rate, how many passes will he complete if he throws 27 passes in a game?

He will complete _____ passes.

5. Mrs. Svage used 3 L of paint to cover 30 m². At this rate, how much paint will be needed to cover 40 m²?

_____ L will be needed.

1.

2.

3.

4.

5.

Lesson 5 Scale Drawings

In a **scale drawing**, the dimensions of the object are in proportion to the actual object. The scale is the ratio of the drawing size to the actual size of the object.

Find the missing information.

scale: 3 cm: 1 km
drawing length: ?
actual length: 4.5 km

Set up a proportion to find the length.

$$\text{scale} \rightarrow \frac{3}{1} = \frac{n}{4.5} \frac{\text{drawing length}}{\text{actual length}}$$

$$3 \times 4.5 = 1 \times n$$

$$13.5 = n$$

The length of the drawing is 13.5 cm.

scale: ? cm: ? m
drawing length: 6 cm
actual length: 12 m

Set up a ratio to find the scale.

$$\frac{6 \text{ cm}}{12 \text{ m}} = \frac{\text{drawing length}}{\text{actual length}}$$

$$\frac{1 \text{ cm}}{2 \text{ m}}$$

The scale is 1 cm: 2 m.

Find the missing information.

a

- scale: _____
drawing length: 5 cm
actual length: 20 m

- scale: 3 cm: 2 m
drawing length: 13.5 cm
actual length: _____

- scale: _____
drawing length: 2.5 cm
actual length: 40 km

- scale: 2 cm: 3 km
drawing length: 3 cm
actual length: _____

b

- scale: 2 cm: 5 m
drawing length: _____
actual length: 35 m

- scale: 1.5 cm: 5 m
drawing length: _____
actual length: 100 m

- scale: 1 m: 0.5 km
drawing length: 4 m
actual length: _____

- scale: _____
drawing length: 1 mm
actual length: 3.5 m

Lesson 5 Problem Solving

Solve each problem.

1. Mr. Jonas made a scale drawing of an addition that he is making to his house. The scale he used is 1 cm: 3 m. The length of the addition is 12 m. What is the length of the addition on the drawing?

The length of the addition on the drawing is _____ cm.

2. Elizabeth is designing a flower garden for her community. The garden will be 9 m wide and 13.5 m long. The drawing has a width of 5 cm. She includes in the drawing a key for the scale that is 1.25 cm long. What actual distance does the key for the scale represent?

The drawing of Elizabeth's garden is scaled as _____.

3. Use the scale from problem 2 to find the length of Elizabeth's garden in the drawing.

Elizabeth's drawing has a length of _____ cm.

4. Mrs. Finney is a sculptor of famous people. She uses a 1 cm: 2 cm scale. She is making a sculpture of the mayor of her city. The finished sculpture is 13.75 cm from the base of the neck to the tip of the head. What is the actual height of his head from the base of his neck to the tip of his head?

The mayor's head from the base of his neck to the tip of his head is _____ cm.

5. The actual size of an artifact is 3 cm by 5.5 cm. In the archive files a drawing that measures 9 cm by 16.5 cm shows every detail of its design. Is the ratio that represents this scale drawing greater than 1, equal to 1, or less than 1?

The scale for the archived drawing is _____.

1.

2.

3.

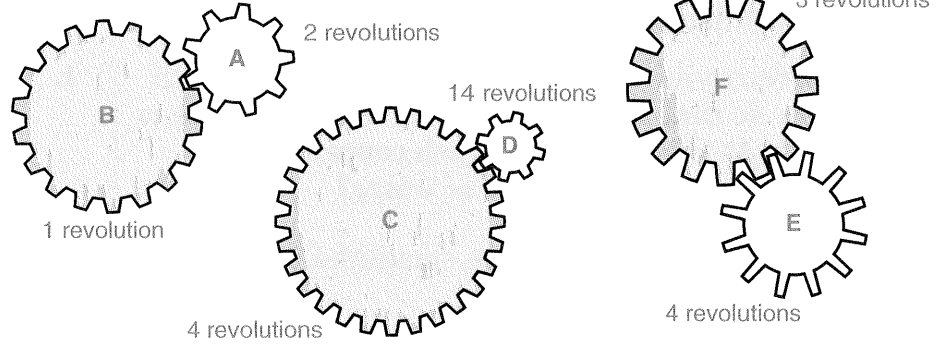
4.

5.

Lesson 6 Problem Solving

PRE-ALGEBRA

As **A** revolves twice,
B revolves once.
 As **C** revolves 4 times,
D revolves 14 times.
 As **E** revolves 4 times,
F revolves 3 times.



Use a proportion to solve each problem.

1. When gear **A** has completed six revolutions, how many revolutions will gear **B** have made?

Gear **B** will have made _____ revolutions.

2. While gear **B** is making 30 revolutions, how many revolutions will gear **A** make?

Gear **A** will make _____ revolutions.

3. When gear **C** has completed 12 revolutions, how many revolutions will gear **D** have made?

Gear **D** will have made _____ revolutions.

4. While gear **D** is making 84 revolutions, how many revolutions will gear **C** make?

Gear **C** will make _____ revolutions.

5. When gear **E** has completed 56 revolutions, how many revolutions will gear **F** have made?

Gear **F** will have made _____ revolutions.

6. While gear **F** is making 90 revolutions, how many revolutions will gear **E** make?

Gear **E** will make _____ revolutions.

7. When gear **E** has completed 76 revolutions, how many revolutions will gear **F** have made?

Gear **F** will have made _____ revolutions.

1.

2.

3.

4.

5.

6.

7.

Lesson 6 Problem Solving PRE-ALGEBRA

Use a proportion to solve each problem.

1. An orange-juice concentrate is to be mixed with water so that the ratio of water to concentrate is 3 to 1. At this rate, how much concentrate should be mixed with 6 L of water?

_____ L of concentrate should be mixed with 6 L of water.

2. A shoe store sells 4 pairs of black shoes for every 7 pairs of brown shoes. There were 4900 pairs of brown shoes sold last year. How many pairs of black shoes were sold?

_____ pairs of black shoes were sold.

3. At the Kolbus Building, 3 out of every 7 employees use public transportation. There are 9800 employees at the building. How many use public transportation?

_____ use public transportation.

4. The ratio of box seats at the hockey arena to general-admission seats is 2 to 7. There are 2500 box seats. How many general-admission seats are there?

There are _____ general-admission seats.

5. At the snack bar, 7 hot dogs are sold for every 10 hamburgers sold. At this rate, how many hot dogs will be sold if 90 hamburgers are sold?

_____ hot dogs will be sold.

6. Jacob delivered 90 flyers in 30 min. At this rate, how long will it take him to deliver 135 flyers?

It will take him _____ min.

7. At the airport, four planes land every 8 min. At this rate, how many planes will land in 1 h?

_____ planes will land in 1 h.

1.

2.

3.

4.

5.

6.

7.

Lesson 7 Percent PRE-ALGEBRA

If n stands for a number, then $n\%$ stands for the ratio of n to 100 or $\frac{n}{100}$.

$$1\% = \frac{1}{100} \text{ or } 0.01$$

$$37\% = \frac{37}{100} \text{ or } 0.37$$

$$125\% = \frac{125}{100} \text{ or } 1.25$$

$$5\% = \underline{\hspace{2cm}} \text{ or } \underline{\hspace{2cm}}$$

$$53\% = \underline{\hspace{2cm}} \text{ or } \underline{\hspace{2cm}}$$

$$149\% = \underline{\hspace{2cm}} \text{ or } \underline{\hspace{2cm}}$$

Complete the following.

	percent	fraction	decimal
1.	3%	_____	_____
2.	27%	_____	_____
3.	121%	_____	_____
4.	7%	_____	_____
5.	39%	_____	_____
6.	141%	_____	_____
7.	9%	_____	_____
8.	11%	_____	_____
9.	167%	_____	_____
10.	57%	_____	_____
11.	251%	_____	_____
12.	69%	_____	_____
13.	391%	_____	_____
14.	87%	_____	_____

Lesson 8 Fractions and Percent

PRE-ALGEBRA

Study how to change a fraction to a percent.

$$\begin{array}{l|l} \frac{4}{5} = \frac{n}{100} & \frac{1}{8} = \frac{n}{100} \\ 400 = 5n & 100 = 8n \\ \\ 80 = n & 12\frac{1}{2} = n \\ \frac{4}{5} = \underline{80\%} & \frac{1}{8} = \underline{12\frac{1}{2}\%} \end{array}$$

Study how to change a percent to a fraction or mixed numeral.

$$\begin{array}{l|l} 175\% = \frac{175}{100} & 3\frac{1}{2}\% = \frac{3\frac{1}{2}}{100} \\ = \frac{7}{4} \text{ or } 1\frac{3}{4} & = 3\frac{1}{2} \times \frac{1}{100} \\ & = \frac{7}{2} \times \frac{1}{100} \\ & = \frac{7}{200} \end{array}$$

Complete the following.

*a**b*

- | | |
|--|--|
| 1. $\frac{1}{4} = \underline{\hspace{2cm}}\%$ | $\frac{3}{8} = \underline{\hspace{2cm}}\%$ |
| 2. $\frac{1}{10} = \underline{\hspace{2cm}}\%$ | $\frac{3}{4} = \underline{\hspace{2cm}}\%$ |
| 3. $\frac{1}{2} = \underline{\hspace{2cm}}\%$ | $\frac{5}{8} = \underline{\hspace{2cm}}\%$ |
| 4. $\frac{7}{10} = \underline{\hspace{2cm}}\%$ | $\frac{2}{5} = \underline{\hspace{2cm}}\%$ |
| 5. $\frac{4}{5} = \underline{\hspace{2cm}}\%$ | $\frac{7}{8} = \underline{\hspace{2cm}}\%$ |

Change each of the following to a fraction or mixed numeral in simplest form.

- | | |
|------------------|---------------------------|
| 6. 10% = _____ | 80% = _____ |
| 7. 160% = _____ | $12\frac{1}{2}\%$ = _____ |
| 8. 250% = _____ | $62\frac{1}{2}\%$ = _____ |
| 9. 20% = _____ | 16% = _____ |
| 10. 125% = _____ | $37\frac{1}{2}\%$ = _____ |

Lesson 9 Decimals and Percent

Study how to change a decimal to a percent.

$$0.3 = 0.30 = \frac{30}{100} = \underline{30}\%$$

$$1.24 = \frac{124}{100} = \underline{124}\%$$

$$0.375 = \frac{37.5}{100} = \underline{37.5}\%$$

$$1.6 = 1.60 = \frac{160}{100} = \underline{\hspace{2cm}}\%$$

$$0.59 = \frac{59}{100} = \underline{\hspace{2cm}}\%$$

$$2.125 = \frac{212.5}{100} = \underline{\hspace{2cm}}\%$$

Study how to change a percent to a decimal.

$$17.6\% = \frac{17.6}{100} = \underline{0.176}$$

$$7.25\% = \frac{7.25}{100} = \underline{0.0725}$$

$$16\frac{3}{4}\% = 16.75\% = \frac{16.75}{100} = \underline{0.1675}$$

$$8.4\% = \frac{8.4}{100} = \underline{\hspace{2cm}}$$

$$9.69\% = \frac{9.69}{100} = \underline{\hspace{2cm}}$$

$$37\frac{1}{2}\% = 37.5\% = \frac{37.5}{100} = \underline{\hspace{2cm}}$$

Complete the following.

a

	decimal	percent
1.	0.2	_____
2.	1.9	_____
3.	0.02	_____
4.	0.36	_____
5.	1.47	_____
6.	0.067	_____
7.	0.123	_____
8.	1.625	_____

b

percent	decimal
52%	_____
148%	_____
5.4%	_____
8.75%	_____
183.75%	_____
$9\frac{1}{2}\%$	_____
$7\frac{1}{4}\%$	_____
$8\frac{3}{4}\%$	_____

Lesson 10 Fractions, Decimals, and Percent

Change each fraction to a percent. Change each percent to a fraction or mixed numeral in simplest form.

a

1. $\frac{1}{8} = \underline{\hspace{2cm}}\%$

2. $80\% = \underline{\hspace{2cm}}$

3. $\frac{3}{5} = \underline{\hspace{2cm}}\%$

4. $87\frac{1}{2}\% = \underline{\hspace{2cm}}$

5. $\frac{1}{10} = \underline{\hspace{2cm}}\%$

6. $31\frac{1}{4}\% = \underline{\hspace{2cm}}$

7. $\frac{4}{25} = \underline{\hspace{2cm}}\%$

8. $110\% = \underline{\hspace{2cm}}$

b

$30\% = \underline{\hspace{2cm}}$

$\frac{1}{5} = \underline{\hspace{2cm}}\%$

$120\% = \underline{\hspace{2cm}}$

$\frac{3}{4} = \underline{\hspace{2cm}}\%$

$150\% = \underline{\hspace{2cm}}$

$\frac{9}{10} = \underline{\hspace{2cm}}\%$

$64\% = \underline{\hspace{2cm}}$

$\frac{9}{20} = \underline{\hspace{2cm}}\%$

Change each decimal to a percent. Change each percent to a decimal.

9. $0.5 = \underline{\hspace{2cm}}\%$

$4\% = \underline{\hspace{2cm}}$

10. $17.7\% = \underline{\hspace{2cm}}$

$1.1 = \underline{\hspace{2cm}}\%$

11. $0.67 = \underline{\hspace{2cm}}\%$

$6.625\% = \underline{\hspace{2cm}}$

12. $8.46\% = \underline{\hspace{2cm}}$

$1.58 = \underline{\hspace{2cm}}\%$

13. $0.125 = \underline{\hspace{2cm}}\%$

$4.075\% = \underline{\hspace{2cm}}$

14. $6.007\% = \underline{\hspace{2cm}}$

$0.312 = \underline{\hspace{2cm}}\%$

15. $6\frac{1}{4}\% = \underline{\hspace{2cm}}$

$9\frac{3}{4}\% = \underline{\hspace{2cm}}$

16. $7\frac{3}{4}\% = \underline{\hspace{2cm}}$

$5\frac{1}{2}\% = \underline{\hspace{2cm}}$

Lesson 11 Comparing and Ordering

When comparing percents, fractions, and decimals, use inequality symbols or the equal symbol to show the relationship.

The **inequality symbols** that show order are

> greater than \geq greater than or equal to

< less than \leq less than or equal to

Replace the _____ with <, >, or = in the following number sentences.

$$0.60 \text{ _____ } \frac{6}{100} \quad \frac{1}{3} \text{ _____ } 30\% \quad 15\% \text{ _____ } 0.165$$

To make comparing easier, rewrite the numbers so that each is in the same format.

$$0.60 \text{ _____ } > \text{ _____ } 0.06 \quad 33\frac{1}{3}\% \text{ _____ } > \text{ _____ } 30\% \quad 0.15 \text{ _____ } < \text{ _____ } 0.165$$

Replace the _____ with <, >, or = in the following number sentences.

<i>a</i>	<i>b</i>	<i>c</i>
1. $0.07 \text{ _____ } \frac{2}{3}$	$\frac{1}{3} \text{ _____ } 0.33$	$85\% \text{ _____ } 8.5$

2. $\frac{4}{5} \text{ _____ } 20\%$	12% _____ 0.012	15% _____ $\frac{1}{15}$
--------------------------------------	-----------------	--------------------------

3. $80\% \text{ _____ } \frac{3}{5}$	$\frac{6}{7} \text{ _____ } 85\%$	2.5 _____ $\frac{5}{2}$
--------------------------------------	-----------------------------------	-------------------------

4. $0.14\% \text{ _____ } \frac{14}{10}$	0.082 _____ 80%	$\frac{7}{11} \text{ _____ } 0.64$
--	-----------------	------------------------------------

Write the numbers from least to greatest.

<i>a</i>	<i>b</i>
5. $\frac{1}{2}, 0.55, 45\%; \text{ _____ } < \text{ _____ } < \text{ _____}$	$90\%, 0.99, 1; \text{ _____ } < \text{ _____ } < \text{ _____}$

Write the numbers from greatest to least.

6. $\frac{3}{4}, 7.5, 68\%; \text{ _____ } > \text{ _____ } > \text{ _____}$ $0.115, 11\%, \frac{1}{11}; \text{ _____ } > \text{ _____ } > \text{ _____}$

Lesson 11 Problem Solving

Solve each problem.

1. Jim ate $\frac{3}{5}$ of a large pizza from a pizzeria. Sonny ate 75% of a large pizza from the same pizzeria. Who ate the largest portion of pizza?

_____ ate the most pizza.

2. Sarah, Johannah, and Trista collect postcards. They each have the same number of postcards in their collections. They decided to compare how many each had from New Brunswick. Sarah said, "half of my collection is from New Brunswick." Trista said, " $\frac{5}{8}$ of my collection is from New Brunswick." Then Johannah proclaimed, "I have you both beat, 62% of my collection is from New Brunswick." Is Johannah's statement true or false? List the girls in order from the one who has the greatest number of New Brunswick postcards to the one who has the fewest New Brunswick postcards.

Johannah's statement is _____.

From greatest to fewest, the number of New Brunswick postcards is _____.

3. Mr. Morrison owned 5 hectares (ha) of land. He decided to distribute the property among his three children. The oldest child received the deed to $\frac{3}{8}$ of his land. The middle child was given $\frac{1}{3}$. The youngest child received about 30% of the land. Write the size of each child's land as a decimal. Decide if the size of land received matched each child's order in the family.

The oldest child received _____ of the land.

The middle child received about _____ of the land.

The youngest child received _____ of the land.

The largest parcel of land was given to the _____ child and the smallest parcel of land was given to the _____ child.

1.

2.

3.

Lesson 12 Percent of a Number

PRE-ALGEBRA

What number is $16\frac{1}{2}\%$ of 90?

$$n = 16\frac{1}{2}\% \times 90$$

$$= 0.165 \times 90$$

$$= \underline{14.85}$$

14.85 is $16\frac{1}{2}\%$ of 90.

What number is 135% of 83?

$$n = 135\% \times 83$$

$$= 1.35 \times 83$$

$$= \underline{112.05}$$

_____ is 135% of 83.

Complete the following.

a

1. _____ is 40% of 20.

2. _____ is 120% of 80.

3. _____ is 33% of 69.

4. _____ is $62\frac{1}{2}\%$ of 840.

5. _____ is 50% of $\frac{3}{8}$.

6. _____ is 85% of 480.

7. _____ is $37\frac{1}{2}\%$ of 64.

8. _____ is 6% of 112.

9. _____ is 80% of 540.

10. _____ is 8% of 180.

b

_____ is 32% of 15.

_____ is 62% of 48.

_____ is 150% of 38.

_____ is 6.7% of 83.

_____ is 7.8% of 65.

_____ is 25% of 23.6.

_____ is 175% of 40.

_____ is 9.6% of 480.

_____ is 12.5% of 49.8.

_____ is 130% of 96.

Solve each problem.

1. Of the building permits issued, 85% were for single-family dwellings. There were 760 permits issued. How many were for single-family dwellings?

_____ were for single-family dwellings.

2. Leona answered all the questions on a test. She had 90% of them correct. There were 40 questions in all. How many did she have correct?

She had _____ correct.

3. Of the 45 seats on the bus, 60% are filled. How many seats are filled?

_____ seats are filled.

4. An oil tank will hold 250 L. The tank is 80% full. How many litres of oil are in the tank?

_____ L of oil are in the tank.

5. A contractor is to remove 600 m³ of earth. So far, 70% of the work has been done. How many cubic metres of earth have been removed?

_____ m³ of earth have been removed.

6. Mrs. Hughes bought a mixture of grass seed that contained 75% bluegrass seed. She purchased 2.5 kg of grass seed in all. How many kilograms of bluegrass seed did she get?

She got _____ kg of bluegrass seed.

7. Mr. Jones' car gets 6.6 km per litre of fuel efficiency. He can improve his fuel efficiency by 15% by getting a tune-up. By how much will his fuel efficiency improve with a tune-up?

His fuel efficiency will improve by _____ km per litre.

1.

2.

3.

4.

5.

6.

7.

Lesson 13 Percent of a Number

PRE-ALGEBRA

25 is what percent of 40?

$$25 = n\% \times 40$$

$$25 = \frac{n}{100} \times 40$$

$$25 = \frac{40n}{100}$$

$$2500 = 40n$$

$$\frac{62.5}{40} = n$$

25 is _____% of 40.

 $\frac{3}{8}$ is what percent of $\frac{1}{2}$?

$$\frac{3}{8} = n\% \times \frac{1}{2}$$

$$\frac{3}{8} = \frac{n}{100} \times \frac{1}{2}$$

$$\frac{3}{8} = \frac{n}{200}$$

$$600 = 8n$$

$$\frac{75}{8} = n$$

 $\frac{3}{8}$ is _____% of $\frac{1}{2}$.

Complete the following.

a

1. 32 is _____% of 64.

2. 88 is _____% of 80.

3. $\frac{3}{8}$ is _____% of $\frac{3}{4}$.

4. $18\frac{3}{4}$ is _____% of 75.

5. 50 is _____% of 80.

6. $\frac{2}{3}$ is _____% of $\frac{5}{6}$.

7. 78 is _____% of 104.

8. 0.72 is _____% of 0.48.

9. $8\frac{1}{3}$ is _____% of $33\frac{1}{3}$.

10. $6\frac{1}{4}$ is _____% of 50.

b

40 is _____% of 50.

67 is _____% of 67.

0.8 is _____% of 3.2.

96 is _____% of 120.

1.6 is _____% of 6.4.

19 is _____% of 76.

19 is _____% of 95.

24 is _____% of 40.

64 is _____% of 80.

0.69 is _____% of 2.76.

Lesson 13 Problem Solving PRE-ALGEBRA

Solve each problem.

1. Last season a baseball player hit 48 home runs. So far this season he has hit 30 home runs. The number of home runs he has hit so far this season is what percent of the number of home runs he hit last season?

The number he has hit this season is _____% of the number he hit last season.

2. In April, 175 cases of toy cars were sold. In May, 125 cases were sold. April's sales were what percent of May's sales?

April's sales were _____% of May's sales.

3. The down payment on a bike is \$15. The bike costs \$75. The down payment is what percent of the cost?

The down payment is _____% of the cost.

4. On a spelling test, Janice spelled 17 words correctly. There were 20 words on the test. What percent of the words did she spell correctly?

She spelled _____% correctly.

5. The Andersons are planning to take a 960-km trip. They will travel 840 km by car. What percent of the distance will they travel by car?

They will travel _____% of the distance by car.

6. During hockey practice, Lea attempted 30 penalty shots and made 21. What percent of these penalty shots did she make?

She made _____% of the shots.

7. Emily's mass is 54 kg, and Marta's mass is 36 kg. Emily's mass is what percent of Marta's mass?

Emily's mass is _____% of Marta's mass.

1.

2.

3.

4.

5.

6.

7.

Lesson 14 Percent of a Number

PRE-ALGEBRA

32 is 16% of what number?

$$32 = 16\% \times n$$

$$32 = \frac{16}{100} \times n$$

$$32 = \frac{16n}{100}$$

$$3200 = 16n$$

$$\frac{200}{1} = n$$

32 is 16% of _____.

1.4 is 5.6% of what number?

$$1.4 = 5.6\% \times n$$

$$1.4 = \frac{5.6}{100} \times n$$

$$1.4 = \frac{5.6n}{100}$$

$$140 = 5.6n$$

$$\frac{25}{1} = n$$

1.4 is 5.6% of _____.

Complete the following.

a

- 37 is 20% of _____.
- 3.4 is 25% of _____.
- 60 is 60% of _____.
- 50 is 40% of _____.
- 264 is 6% of _____.
- 18 is 75% of _____.
- 8.7 is 30% of _____.
- 9 is 100% of _____.
- 144 is 24% of _____.
- 192 is 75% of _____.

b

- 92 is 50% of _____.
- 60 is 150% of _____.
- 9 is 30% of _____.
- 78 is 60% of _____.
- 84 is 12% of _____.
- 2.6 is 50% of _____.
- 72 is 80% of _____.
- 1.3 is 65% of _____.
- 2.16 is 3.6% of _____.
- 12.8 is 6.4% of _____.

Solve each problem.

- 1. Mr. Buccola has a tree that is 15 m tall. He estimates that the tree is 75% as tall now as it will be when fully grown. How tall will the tree be when fully grown?

The tree will be _____ m tall.

- 2. There are 35 boys on the school football team. This number represents 5% of the school's total enrollment. What is the school's total enrollment?

The school's total enrollment is _____.

- 3. Jessica has read 120 pages of a library book. This is 40% of the book. How many pages are there in the book?

There are _____ pages in the book.

- 4. When operating at 75% capacity, a factory can produce 360 cases of nails each day. How many cases of nails can be produced each day when the factory is operating at full capacity?

_____ cases can be produced each day.

- 5. Brianna received 212 votes for class secretary. This was 53% of the total number of votes cast. How many votes were cast?

_____ votes were cast.

- 6. Kristen has earned 75% of the points she needs for a prize. She has earned 660 points. How many points are needed to win a prize?

_____ points are needed.

- 7. Emma can throw a baseball 8 m. This is 80% as far as her older brother can throw the ball. How far can her older brother throw the ball?

Her older brother can throw the ball _____ m.

1.

2.

3.

4.

5.

6.

7.

Lesson 15 Percent PRE-ALGEBRA

Complete the following.

a

1. _____ is 40% of 30.
2. 26 is _____% of 50.
3. 39 is 52% of _____.
4. 37 is _____% of 50.
5. 18 is 25% of _____.
6. _____ is 24% of 96.
7. 0.7 is _____% of 1.4.
8. 3.9 is 75% of _____.
9. _____ is 6.8% of 720.
10. 64 is 125% of _____.
11. 175 is _____% of 125.
12. _____ is 120% of 720.
13. $\frac{1}{3}$ is _____% of $\frac{5}{6}$.
14. _____ is 60% of 1000.
15. 15 is 50% of _____.
16. _____ is 25% of 4.

b

- 73 is _____% of 365.
- 24 is 60% of _____.
- _____ is 25% of 76.
- _____ is 60% of 360.
- 69 is _____% of 276.
- 8 is 16% of _____.
- _____ is 50% of 98.4.
- 0.09 is _____% of 0.25.
- 0.95 is 1.9% of _____.
- _____ is 100% of 986.
- 98 is 150% of _____.
- 275 is _____% of 125.
- 30 is 75% of _____.
- 1 is _____% of 1.
- _____ is 75% of 2.
- 73 is 25% of _____.

Solve each problem.

1. There are 850 students at a school. Of these, 36% are in grade 8. How many students are in the grade 8?

_____ students are in grade 8.

2. Mail was delivered to 171 out of the 180 houses on Saylor Street. To what percent of the houses on Saylor Street was mail delivered?

Mail was delivered to _____% of the houses.

3. A savings bond costs \$18.75 and can be redeemed at maturity for \$25. The cost of the bond is what percent of its value at maturity?

Its cost is _____% of its value at maturity.

4. Mrs. Wilson sold merchandise to 25% of the clients she contacted. She sold to six clients. How many clients did she contact?

She contacted _____ clients.

5. A store sold 185 bicycles last month. Of those, 60% were girls' bicycles. How many girls' bicycles were sold?

_____ girls' bicycles were sold.

6. Of the library books turned in today, 95% were turned in on time. There were 285 books turned in on time. What was the total number of books turned in?

There were _____ books turned in.

7. The enrollment at Pleasant Street School is 110% of last year's enrollment. The enrollment last year was 390. What is the enrollment this year?

The enrollment this year is _____.

1.

2.

3.

4.

5.

6.

7.

CHAPTER 5 PRACTICE TEST

Ratio, Rate, Proportion, and Percent

Express each of the following as a ratio or a rate in two ways as shown.

	<i>a</i>	<i>b</i>
1. 8 goals in 3 games	<u>8 to 3</u>	<u>$\frac{8}{3}$</u>
2. 5 policemen to 4 firemen	_____	_____
3. 4 planes in 30 minutes	_____	_____
4. 5 quarts for 9 boys	_____	_____

Solve the following.

$$5. \quad \begin{array}{l} a \\ \frac{n}{3} = \frac{12}{36} \end{array} \qquad \begin{array}{l} b \\ \frac{4}{n} = \frac{16}{20} \end{array}$$

$$6. \quad \frac{8}{9} = \frac{n}{45} \qquad \frac{7}{8} = \frac{49}{n}$$

$$7. \quad \frac{18}{24} = \frac{n}{16} \qquad \frac{n}{12} = \frac{4}{16}$$

Complete the following.

- | <i>a</i> | <i>b</i> |
|--|-----------------------------------|
| 8. _____ is 35% of 64. | 11 is _____% of 55. |
| 9. 18 is _____% of 25. | 30 is 7.5% of _____. |
| 10. $1\frac{3}{4}$ is _____% of $2\frac{1}{2}$. | _____ is $12\frac{1}{2}$ % of 27. |
| 11. _____ is 150% of 180. | 2.4 is _____% of 9.6. |

CHAPTER 6 PRETEST**Simple/Compound Interest**

Complete the following for simple interest.

	principal	rate	time	interest
1.	\$320	7%	1 year	
2.	\$300	$5\frac{1}{2}\%$	$\frac{1}{2}$ year	
3.	\$800	10%		\$80
4.	\$500		$\frac{1}{4}$ year	\$10
5.		16%	2 years	\$192
6.	\$26 000		4 years	\$9360

Interest is to be compounded in each account below. Find the total amount that will be in each account after the period of time indicated.

	principal	rate	time	compounded	total amount
7.	\$200	6%	2 years	annually	
8.	\$100	5%	3 years	annually	
9.	\$300	8%	$1\frac{1}{2}$ years	semiannually	
10.	\$400	5%	1 year	quarterly	