

7-3 EXTRA PROBLEMS

LESSON 7-3.1

1. The students in Mr. Shane's art class are mixing red and blue paint. He tells them that two mixtures will be the same shade of purple if the blue and red paint are in the same ratio.

The table below shows the different mixtures of paint that the students made.

	A	B	C	D	E
# of red parts	1	2	3	4	6
# of blue parts	2	3	6	6	9

- a. How many different shades of paint did the students make?
2 different shades (A and C are equivalent to 1:2; B, D, and E are equivalent to 2:3)
- b. Some of the shades of paint were bluer than others. Which mixture(s) were the bluest? Show work or explain how you know.
A and C are the bluest. For example, comparing C (3:6) to D (4:6), there is less red in C than D compared to the same amount of blue in both.

2. The table below represents the amount of money shirts cost at a thrift shop.

# of shirts	5	8	3	10
Amount in dollars	17.5	28	10.5	35

- a. Does the table represent a proportional relationship? Explain.
Yes, they are all equivalent to 2:7, and the value of the ratios all equal $\frac{2}{7}$.
- b. What is the unit rate in cost per shirt for the table?
3.5 or \$3.50 per shirt
3. The office supply store sells pencils in different sets. Set A is \$5 for 24 pencils. Set B is \$11 for 72 pencils. Set C is \$4 for 18 pencils.
- a. Find the unit price for each set.
Set A: \$0.21/pencil, Set B: \$0.15/pencil, Set C: \$0.22/pencils
- b. What is the best deal?
Set B is the cheapest.

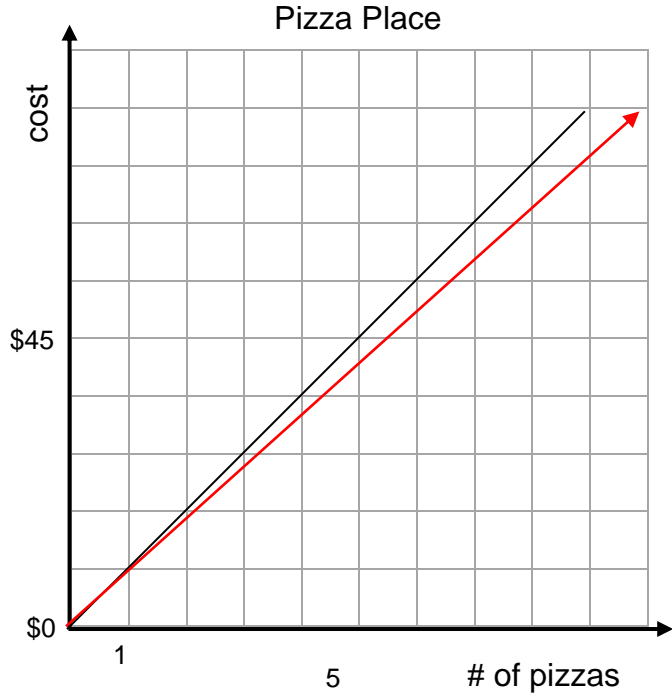
LESSON 7-3.1

Continued

4. Luke is choosing to order from, Door-to-Door Pizza and Pizza Place. Luke started to create tables and graphs to compare cost for different amounts of pizza. Complete the information as directed.

DOOR-TO-DOOR	
# of pizzas (x)	cost (y)
1	8
2	16
3	24
4	32
5	40

PIZZA PLACE	
# of pizzas (x)	cost (y)
0	0
1	9
2	18
3	27
4	36



- Copy and complete the tables and draw a graph for Door-to-Door pizza.
- Do both graphs represent proportional relationships? Explain.
Yes, they are both straight lines that go through the origin.
- What is the unit price for Door-to-Door Pizza? *8 or \$8 per pizza*
- What is the unit price for Pizza Place? *9 or \$9 per pizza*
- Which pizza place is the better buy? Explain. *Door-to-Door is cheaper.*

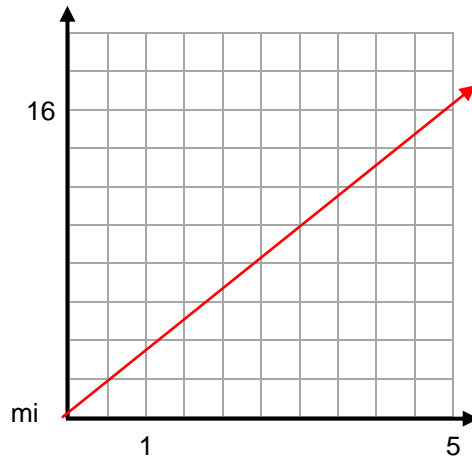
LESSON 7-3.2

1. Camila participated in a walk-a-thon to raise money for cancer research. She recorded some of the time and total distance information, but left the table incomplete. Assume Camila walked at a constant rate of speed.

a. Copy and complete the table below.

Time in hours	Miles walked
1	3.2
2	6.4
4	8
5	16

b. Create a graph on a coordinate plane from the table.



c. Is the relationship between hours and miles proportional? Explain.

Yes. It said she ran at a constant rate.

d. What was Camila's walking rate in miles per hour? 3.2 miles/hour

e. How long did it take Camila to walk one mile? 0.3125 (or about 0.3) hours per mile

f. Write an equation for the distance d , in miles, that Camila walked in n hours. $d = 3.2n$

g. Next year Camila is planning to walk for eight hours. If she walks at the same speed next year, how many miles will she walk? 25.6 miles

h. If Camila's brother Nelson walked half as fast as Camila, how long would it take him to walk 5 miles? 3.125 hours

LESSON 7-3.2

Continued

2. Isaiah sold candy bars to help raise money for his scouting troop. The table shows the amount of candy he sold compared to the money he received. Is the amount of candy bars sold proportional to the money Isaiah received? Explain.

# of candy bars sold (x)	2	4	8	12
money received in \$ (y)	3	5	9	12

No. Ratios formed ($x : y$) within the table are not equivalent. Unit rates, whether dollars per candy bar or candy bars per dollar are not equal.

3. Cory and two of his friends are racing toy cars. The graphs below are all line segments that show the distance d , in meters, that each of three cars traveled after t seconds.

- a. Each graph has a point labeled. Describe what each of these points tell you about how far that car has traveled.

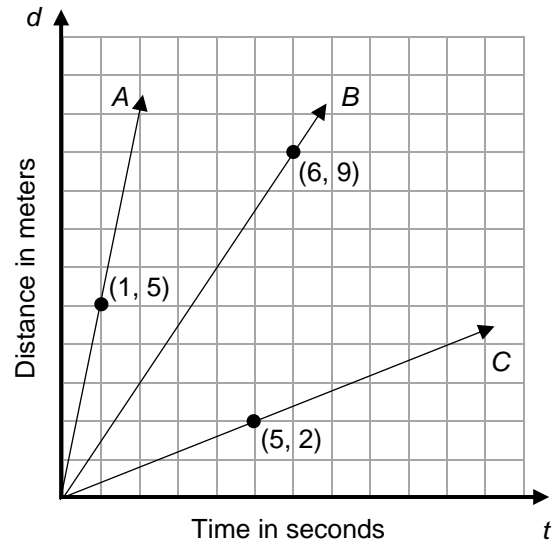
A: 5 meters in 1 second; B: 9 meters in 6 seconds;
C: 2 meters in 5 seconds

- b. Cory said that for each graph, the ratio of the number of seconds each car travels to the number of meters it has traveled is constant. Is he correct? Explain.

Yes, they must be in order to have straight lines.

- c. How fast is each car traveling (meters per second)?

A: 5 m/s; B: 1.5 m/s; C: 0.4 m/s



4. Each table below represents a proportional relationship. Copy and complete each table and find the constant of proportionality (unit price).

a.

# of widgets	0	2	4	10	15
\$	0	8	16	40	60

0.25 widgets per \$

b.

# of widgets	2	10	60	30	8
\$	1	5	30	15	4

2 widgets per \$

LESSON 7-3.3

1. Two ways to show ratios are proportional are shown below.

<u>Equivalent Fractions Example</u>	<u>Cross Multiplication Example</u>
$\frac{3}{12} = \frac{2}{8} ?$	$\frac{3}{12} = \frac{2}{8} ?$
$\frac{3}{12} \cdot \frac{8}{8} = \frac{2}{8} \cdot \frac{12}{12} ?$	$3(8) = 2(12) ?$
$\frac{24}{96} = \frac{24}{96}$ YES	$24 = 24$ YES

Why is the cross-multiplication example a shortcut of the equivalent fractions example?
Cross multiplication has the effect of multiplying only the numerators of the equivalent fractions example and disregarding the (equivalent) denominators.

2. Solve each equation using any method.

a. $\frac{3}{4} = \frac{6}{x}$ $x = 8$ b. $\frac{x}{16} = \frac{5}{10}$ $x = 8$ c. $\frac{3}{x} = \frac{-4}{8}$ $x = -6$

3. Dana looked at the proportion equation $\frac{2}{3} = \frac{4}{6}$ and said, "I can flip that over and still have a true equation." She then wrote $\frac{3}{2} = \frac{6}{4}$.

- a. Prove that Dana is correct for this example.

$2(6) = 4(3); 12 = 12$ and $3(4) = 6(2); 12 = 12$

- b. Write another pair of proportion that are true the way Dana sees it.

Example: $\frac{1}{2} = \frac{3}{6}$ and $\frac{2}{1} = \frac{6}{3}$

4. Solve each word problem.

- a. Five milliliters of a children's medicine contains 400 mg of the drug amoxicillin. How many mg of amoxicillin does 25 mL contain? **2,000 mg**
- b. Vladimir Radmanovic of the Seattle Supersonics makes, on average, about 2 three-pointers for every 5 he shoots. If he attempts 10 three-pointers in a game, how many would you expect him to make? **4 three-pointers**
- c. In 2002, a 30-second commercial during the Super Bowl cost an average of \$1,900,000. At this rate, how much would a 45-second commercial cost? **\$2,850,000**

LESSON 7-3.3

Continued

5. Solve each unit rate problem.
- While exercising Jerry walked $\frac{1}{6}$ of a mile in $\frac{1}{5}$ of an hour. At this rate, how far will he have traveled in an hour? $\frac{5}{6}$ miles per hour
 - It takes a baker $\frac{1}{9}$ of an hour to make enough cookies to fill $\frac{1}{10}$ of a large box. How long would it take for him to fill the whole box? $1\frac{1}{9}$ hour per box
 - A carpenter goes through $3\frac{3}{4}$ boxes of nails finishing $\frac{1}{5}$ of a roof. How much would he use finishing the entire roof? $18\frac{3}{4}$ hours per box
 - A container with $2\frac{2}{3}$ gallons of weed killer can spray $2\frac{1}{3}$ lawns. How many gallons would it take to spray 8 lawns? $9\frac{1}{7}$ gallons for 8 lawns
6. Solve using any method and show your work (e.g. rates, proportions, or diagrams). Assume a constant rate of painting for all problems. Do not include other factors such as rest breaks.
- It takes Ping 20 minutes to paint a fence that is 3 feet tall and 10 feet long, what is Ping's rate in square feet per minute (ft²/min)? 1.5 square feet per minute
 - If Yuri paints 1 square yard in 2 minutes, how long will it take her to paint a fence that is 3 feet tall and 30 feet long? 20 minutes
 - If George paints 1 square foot in 1 minute 30 seconds, how many minutes will it take her to paint a fence that is 1 yard by 10 yards? 135 minutes