Name_____ Period _____ Date _____

7-3 EXTRA PROBLEMS
LESSON 1

7.RP.2a

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 mixtures were the bluest? Explain. 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.

7.NS.3, 7.RP.1, 7.RP.2ab

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. The shirt to dollar ratios are all equivalent to 2:7 (the value of this ratio is $\frac{2}{7}$). The dollar to shirt ratios are all equivalent to 7:2 (the value of this ratio is $\frac{7}{2}$).

   b. What is the unit rate in cost per shirt for the table?
   3.5 or $3.50 per shirt

7.NS.3, 7.RP.1, 7.RP.2b

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.
   Rounded prices: Set A: $0.21/pencil, Set B: $0.15/pencil, Set C: $0.22/pencils

   b. What is the best deal? Explain.
   If the determining factor is price, Set B is the cheapest.

Name_____ Period _____ Date _____

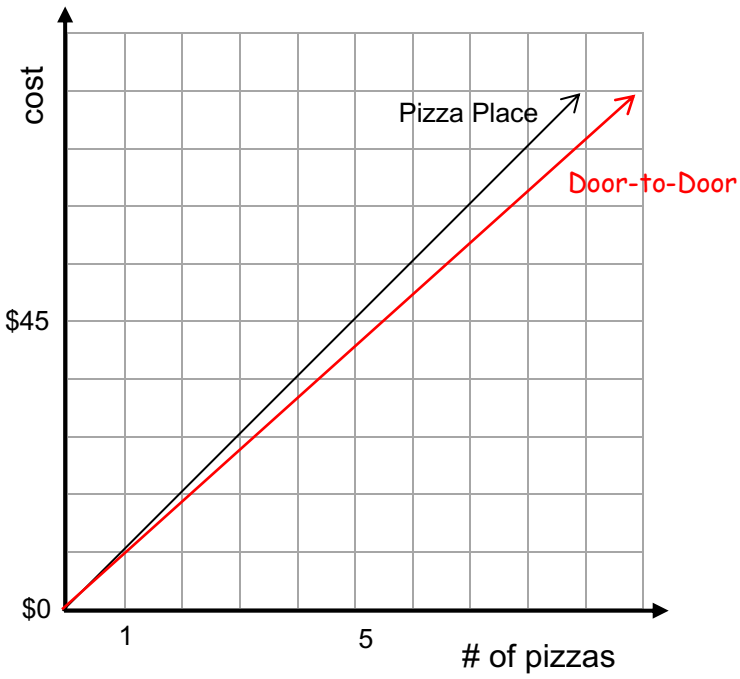
7-3 EXTRA PROBLEMS
LESSON 1
Continued

7.RP.1, 7.RP.2ab

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



a. Copy and complete the tables and draw a graph for Door-to-Door pizza.

b. Do both graphs represent proportional relationships? Explain.
Yes, they are both straight lines that go through the origin.

c. How can you tell from the table that these are proportional relationships?
For each respective table, all entries are constant multiples of all other entries.

d. What is the unit price for Door-to-Door Pizza? 8 or $8 per pizza

e. What is the unit price for Pizza Place? 9 or $9 per pizza

f. Which pizza place is the better buy? Explain. Door-to-Door is cheaper.

Name_____ Period _____ Date _____

7-3 EXTRA PROBLEMS
LESSON 2

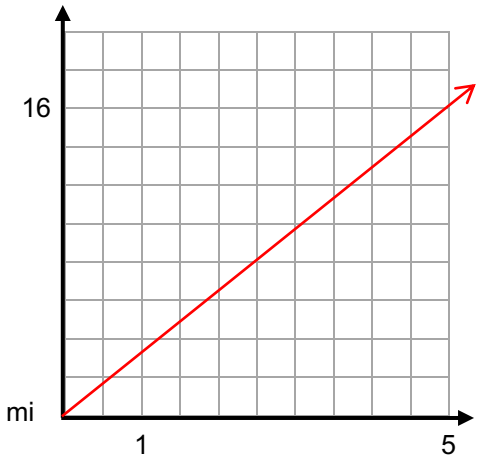
7.NS.3, 7.EE.3, 7.RP.1, 7.RP.2abc

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	12.8
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's given that she walked at a constant rate of speed. The graph is a straight line through the origin. The entries in the table are constant multiples of one another.

   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; note that 0.3125 times 60 minutes is 18.75 minutes.

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

   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

Name_____ Period _____ Date _____

7-3 EXTRA PROBLEMS
LESSON 2
Continued

7.RP.2a

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.

7.RP.1, 7.RP.2abd

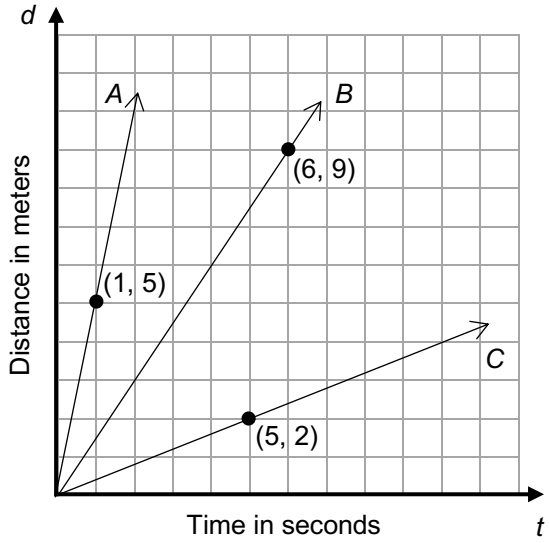
3. Cory and two of his friends are racing toy cars. The graphs below are all lines that show the distance *d*, in meters, that each of three cars traveled after *t* seconds.

   a. Each graph has a point labeled. Describe what each of these points tells you about the time and distance 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, this must be true in order for the graphs to be straight lines.

   c. How fast is each car traveling (in m/sec)?
   A: 5 m/s; B: 1.5 m/s: C: 0.4 m/s

   d. Which car is traveling the fastest? The slowest?
   A is the fastest; C is the slowest



7.RP.1, 7.RP.2b

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 $

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7-3 EXTRA PROBLEMS
LESSON 3

No direct correlation

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

Equivalent Fractions Example	Cross Multiplication Example
$\frac{3}{12} = \frac{2}{8}$?	$\frac{3}{12} = \frac{2}{8}$?
$\frac{3}{12} \bullet \frac{8}{8} = \frac{2}{8} \bullet \frac{12}{12}$?	$3(8) = 2(12)$?
$\frac{24}{96} = \frac{24}{96}$ 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.

No direct correlation

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. $\frac{3}{x} = \frac{-4}{8}$ $x = -6$

No direct correlation

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. Is Dana is correct? Explain.
   Yes, both equations show equivalent fractions (though each has different values than the other)
   b. Write another pair of proportion equations that are true the way Dana sees it.
   Answers will vary. Example: $\frac{1}{2} = \frac{3}{6}$ and $\frac{2}{1} = \frac{6}{3}$

7.EE.3

4. Solve each problem.

   a. Five milliliters of a medicine contains 400 mg of the drug amoxicillin. How many mg of amoxicillin does 25 mL contain? 2,000 mg

   b. From 2001 to 2006, Vladimir Radmanovic of the Seattle Supersonics made, on average, about 2 three-pointers for every 5 shot attempts. 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

Name_____ Period _____ Date _____

7-3 EXTRA PROBLEMS
LESSON 3
Continued

7.RP.1, 7.RP.2b, 7.NS.3, 7.EE.3

5. Solve each unit rate problem.

   a. 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

   b. It takes a baker $\frac{1}{9}$ of an hour to make enough cookies to fill $\frac{1}{10}$ of a large box. At this rate, how long would it take for him to fill the whole box? $1\frac{1}{9}$ hour per box

   c. A carpenter goes through $3\frac{3}{4}$ boxes of nails to finish $\frac{1}{5}$ of a roof. At this rate, how much would he use to finish the entire roof? $18\frac{3}{4}$ hours per box

   d. A container with $2\frac{2}{3}$ gallons of weed killer can spray $2\frac{1}{3}$ lawns. At this rate, how many gallons would it take to spray 8 lawns? $9\frac{1}{7}$ gallons for 8 lawns

7.RP.1, 7.RP.2b, 7.NS.3, 7.EE.3

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.

   a. 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 (ft^2/min)? 1.5 square feet per minute

   b. 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

   c. 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