Study Guide
Proportional Reasoning

SOL 7.4

What do I need to know for the upcoming assessment?

- Identify if two ratios form a proportion
- Solve proportions
- Find unit rates using proportions
- Solve practical problems using proportions
- Consumer Math (taxes, tips, & discounts)

What should I do to prepare for the assessment?

- Review your class notes, practice, and homework assignments
- Practice on IXL (7th grade):

| L.4   | Estimate percents of numbers          |
| L.5   | Percents of numbers and money amounts |
| L.6   | Percents of numbers, word problems    |
| L.7   | Solve Percent Equations              |
| M.6   | Percent of a number: tax, discount and more |
| M.7   | Find the percent: tax, discount and more |
| M.8   | Sales price: find the original price  |
| M.9   | Multi-step problems with percents     |
| M.10  | Estimate tips                         |

- See your teacher for help BEFORE the assessment date
- Complete the attached practice exercises.

CALCULATORS WILL BE PERMITTED ON THE ASSESSMENT
1) Determine if the following ratios form a proportion.

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<tbody>
<tr>
<td>a)</td>
<td>( \frac{13}{6} ) and ( \frac{91}{42} )</td>
<td>b) ( \frac{19}{18} ) and ( \frac{342}{327} )</td>
</tr>
<tr>
<td>c)</td>
<td>( \frac{14}{17} ) and ( \frac{42}{68} )</td>
<td>d) ( \frac{8}{9} ) and ( \frac{128}{144} )</td>
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2) Solve the following proportions.

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<tr>
<td>a) ( \frac{15}{x} = \frac{12}{20} )</td>
<td>b) ( \frac{5}{8} = \frac{b}{72} )</td>
<td>c) ( \frac{-7}{n} = \frac{63}{81} )</td>
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<tr>
<td>d) ( \frac{1}{5.3} = \frac{3}{r} )</td>
<td>e) ( \frac{7}{t} = \frac{18}{108} )</td>
<td>f) ( \frac{12.6}{0.7} = \frac{k}{1.5} )</td>
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3) During a fundraiser at Mercer Middle School, the school received $5 for every 2 items sold. If the students sold 400 items, how much money did Mercer receive?

4) At Office Depot 35 pencils cost $4.60, how much would 80 pencils cost?

5) Use the chart to the right. If Sam's dog weighs 8 kilograms, about how many pounds does the dog weigh?
6) Look at the map below.

If London is 1 inch from Paris, which proportion can be used to find the distance between the two cities?

a) \(1:x = 2:600\)
b) \(1:600 = 2:x\)
c) \(1:600 = x:2\)
d) \(1:x = 600:2\)

7) Melissa reads 60 pages in 3 hours. Circle all the proportions that can be used to find about how many pages she reads in 5 hours?

\[
\begin{array}{ccc}
60: 5 = x:3 & \frac{3}{60} = \frac{x}{5} & 60: 3 = x:5 \\
60 \quad x & 60 \quad 5 & 3 \quad 5 \\
3 \quad \frac{x}{5} & \frac{5}{x} & \frac{60}{x}
\end{array}
\]

8) You paid $18.36 at the gas station for 6 gallons of gas.

a) How much would 9 gallons of gasoline cost?

b) How much gasoline can you buy for $37.49?
9) You travel 247 miles in $4\frac{3}{4}$ hours while driving.
   a) At this rate, how far can you drive in 5 hours?
   b) At this rate, how long will it take to drive 31 miles?

10) Express each ratio as a unit rate. Round each answer to the nearest hundredth.

<table>
<thead>
<tr>
<th>a) $15.64$ for 5.3 pounds of grapes.</th>
<th>b) $325.09$ for dinner for six people.</th>
</tr>
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<tbody>
<tr>
<td>c) $198$ for 4 concert tickets.</td>
<td>d) $29.58$ for 3 pounds of chocolate.</td>
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11) Mr. Jacobsen took his family to dinner. The bill came to $67. He wants to leave a 15% tip. How much money will Mr. Jacobsen need in all?

12) Chloe wants to buy a pair of jeans that cost $28. How much tax will she pay if the sales tax rate is 7%?

13) Nathan buys two video games for $29.99 each, a new cable for $12.99, and a game case for $27.50. If the sales tax is 8%, what is the total cost including tax?

14) Sarah spent 40% of the money she earned babysitting. If she spent $85, how much money had she earned babysitting?
15) At Freedom High School, 0.5% of students are on the wrestling team. If there are 12 students on the wrestling team, about how many students attend Freedom High School?

16) Griffin wants to buy a new cell phone. The phone he wants is $149 after a 15% discount. What is the regular (original) price of the phone?

17) During the past 3 months 17 laptops sold each week for every 23 tablets. If 5 tablets sold last week, about how many laptops were sold?

18) Aaryan saves 12% of his paycheck each week. If Aaryan makes $600 per week, how much money will he save in 8 weeks?

19) Mrs. Koop is hosting a party. The punch recipe calls for 3 liters of soda for every 8 liters of fruit juice. If she has 6 liters of fruit juice, how many liters of soda will she need?

20) Five stores are running specials on lunchmeat. Which store has the best price for the shopper?

|   | a) $8.49 for 3 lbs. | b) $7.29 for 2.5 lbs. | c) $5.89 for 2 lbs. | d) $12.79 for 4 lbs. | e) $13.19 for 4.5 lbs. |

21) David earns $56.10 for six hours of work. If he wants to make at least $73, how many hours must he work?

**Answer Key**

SG-M67-Proportional Reasoning (SOL 7.4) 2014-2015
1) a) yes; b) no; c) no; and d) yes

2) a) \( x = 25 \); b) \( b = 45 \); c) \( n = -9 \); d) \( r = 15.9 \); e) \( t = 42 \); and f) \( k = 27 \)

3) \( $1,000 \)

4) \( $10.51 \)

5) About 18 pounds

6) a

7) \( 60:3 = x:5; \ \frac{60}{3} = \frac{x}{5} \) and \( \frac{3}{60} = \frac{5}{x} \)

8) a) \$27.54; and b) About 12.25 gallons

9) a) 260 miles; and b) About 0.6 hours

10) a) \$2.95/lb.; b) $54.18/person; c) $49.50/ticket; and d) $9.86/lb.

11) \$77.05 altogether

12) $1.96 in sales tax

13) $108.51 in all

14) $212.50

15) 2,400 students

16) $175.29

17) About 4 laptops

18) $576

19) 2.25 liters of soda

20) Store A

21) 8 hours