

5D Proportions.doc

Prealgebra

Name: _____ Due Date: _____

WHY: Proportional reasoning is used when you want to apply the same ratio or rate (for example, speed or price per pound) to a different-sized quantity.

Learning Objectives:

- 1) Convert between verbal expressions and rates.
- 2) Convert between verbal sentences and proportions.
- 3) Solve proportions and explain your solution method.

Warm-up (no calculators):

- 1) Use balance and working backwards to solve for F : $\frac{5}{9}(F - 32) = 45$
Show each step of your work.

Activity:

One cup of breakfast cereal contains 15% of the recommended daily allowance (RDA) of iron. This nutritional information may be represented as a **rate**, which is a fraction with

different units on the top and bottom: $\frac{15\%}{1 \text{ cup}}$.

- 1) What percent of iron is in 2 cups of cereal? Represent this as a fraction in the equation.

$$\frac{15\%}{1 \text{ cup}} = \frac{\quad}{2 \text{ cups}}$$

- 2) Explain how you obtained the answer to the previous problem.

- 3) How many cups of cereal are needed for 60% of the daily recommended iron intake? Represent this as a fraction in the equation.

$$\frac{15\%}{1 \text{ cup}} = \frac{60\%}{\quad}$$

- 4) Explain how you obtained the answer to the previous problem.

- 5) Complete the equation. Write the meaning of this equation in context.

$$\frac{15\%}{1 \text{ cup}} = \frac{\quad}{3 \text{ cups}}$$

- 6) Complete the equation. Write the meaning of this equation in context.

$$\frac{15\%}{1 \text{ cup}} = \frac{90\%}{\quad}$$

5D Proportions.doc

In the two previous problems, two rates (or two ratios) are equal. **Equations with two equal ratios, or two equal rates, are called Proportions.**

7) The speed you drive your car is a rate, or a ratio of the distance driven and the driving time. Speed is the distance driven divided by the time to drive that distance, which may be represented as a fraction.

a) What is your speed (as a fraction) if you drive 250 miles in 5 hours? _____

b) If you continue to drive at this same speed (equal rate), the how far can you drive in 10 hours? Represent this in the equation as two equal rates, equal ratios, which is a **proportion**. _____ = _____

c) If you continue to drive at this same speed, how long will it take to drive to Denver, about 1000 miles? _____ = _____

d) Represent this as a proportion.

e) If you continue to drive at this same speed, how far would you drive in one hour?

f) Represent this as a proportion. In this case, when the denominator of a rate is one, 1, then it is called a unit rate. A unit rate is usually what we think of when we talk about driving speed: 65 miles per hour, which means 65 miles are driven in one hour. _____ = _____

8) Let's take a speed of 65 miles per hour (mph).

a) How far would we travel in 4 hours?

b) Represent this as a proportion. _____ = _____

c) If we are still traveling at 65 mph, how long would it take to drive 390 miles?

d) Represent this as a proportion. _____ = _____

9) Another example is the cost of the food you buy. 8 pounds of bananas for \$5.60, or 560 cents. The rate, or price per pound, of bananas is the price divided by the number of pounds.

a) Represent this rate as a fraction: rate = _____

b) At this same rate, how much would one pound of bananas cost?

c) Explain how you obtained the answer to the previous problem.

d) Represent this as a proportion. _____ = _____

e) At this same rate, how much would one fourteenth of a pound of bananas cost?

5D Proportions.doc

f) Explain how you obtained the answer to the previous problem.

g) Represent this as a proportion. _____ = _____

h) Circle the fraction that represents the unit rate. $\frac{\$0.70}{1 \text{ lbs}}$ $\frac{\$1.00}{1.43 \text{ lbs}}$ $\frac{1\text{c}}{0.0143\text{lbs}}$ $\frac{8 \text{ lbs}}{560\text{c}}$

i) At the same unit rate, how much would 5 pounds of bananas cost?

j) Represent this as a proportion. _____ = _____

k) At this same unit rate, how many pounds of bananas are purchased for \$2.60?

l) Explain how you obtained the answer to the previous problem.

_____ = _____
m) Represent this as a proportion.

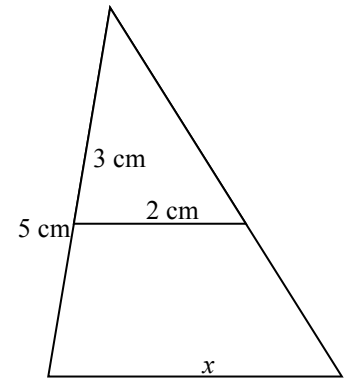
n) At this same unit rate, how many pounds of bananas are purchased for \$4.00?

o) Explain how you obtained the answer to the previous problem.

_____ = _____
p) Represent this as a proportion.

5D Proportions.doc

- 10) The two triangles in the figure are *similar* (the same shape). Use a proportional reasoning problem-solving process to find the length of the base of the large triangle.



- 11) The two triangles in the figure are *similar* (the same shape). Use a proportional reasoning problem-solving process to find x .

