

Ratios and Scale Factors

Name: _____

Class: _____

Date: _____

Ratios:

Ratios are comparisons of two or three quantities. A ratio can be written using a colon, using the word “to” or in fraction form.

Some basic ratio problems:

1. Molly’s favorite juice drink is made by mixing 3 cups of apple juice, 2 cups of cranberry juice, and 3 cups of sparkling water. Write the following ratios:
 - a. What is the ratio of apple juice to cranberry juice?
 - b. What percent of the total mix is sparkling water?
 - c. Molly wants to keep the ratio of drink components constant when she makes a large batch. If she needs 32 cups of the total drink, how much apple juice should she buy? Show the work to get your answer. A ratio table may help you.

Apple Juice	3						
Total Drink	8						

- d. If she makes a 44 cup batch, how much apple juice and cranberry juice will she need? Show the work to get your answer. A ratio table may help you.

Apple	3						
Cranberry	2						
Total Drink	8						

2. Jim is driving at a constant rate of 40 miles per hour. If he continues at that rate, how long will it take him to drive 120 miles? To drive 160 miles? To drive 100 miles? Use the ratio table below to get your answer.

Miles	40	80					
Hours	1						

Time for a) 120 miles: _____ b) 160 mi: _____ c) 100 mi: _____

3. Kelly reads 8 pages every 15 minutes. Use a ratio table to determine how many pages she can read in an hour and a half.

Pages	8					
Minutes	15					

Scale Factor:

Scale factor (or multiplier) is the ratio comparing the length of one side of one figure to the same side in another figure. The mathematical term for those “same sides” is **corresponding sides**. A **scale factor** is special kind of ratio that tells you how much bigger or smaller one figure is compared to the other. It is critical that a scale factor be

written in the form: $\frac{\text{new}}{\text{original}}$.

The mathematical term for two or more figures that have exactly the same shape but are not necessarily the same size is **similar figures**. The scale factor will tell you how much bigger or smaller one similar figure is compared to another. It is important to remember that the scale factor has to do with the lengths of the sides of the figures, not the areas of the figures.

Some basic scale factor problems:

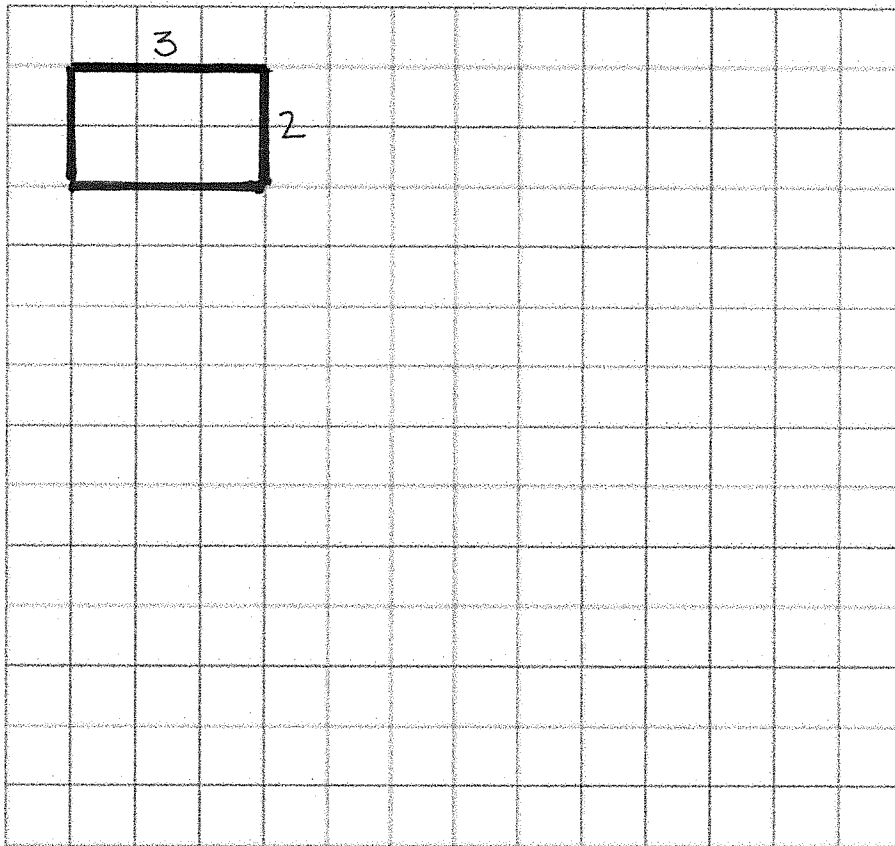
1. If a rectangle is being enlarged. The original rectangle has sides that are 8” x 9”. The enlarged rectangle has sides that are 24” x 27”. What is the scale factor?
2. A triangle has sides that are 3 cm, 4 cm, and 5 cm. The first two sides of a similar triangle are 24 cm and 32 cm.
 - a. What is the scale factor?
 - b. What will be the length of the third side of the enlarged triangle (that would be the side that corresponds to the 5 cm side of the original triangle)?
3. A rectangle is 4 m x 12 m. A similar rectangle has a shorter side that is 14 m.
 - a. What is the scale factor?
 - b. Use a proportion (two ratios with an equal sign between them) to find the length of the new rectangle’s longer side.

4. A rectangle has sides that are 6' x 8'. A similar rectangle is smaller. It has a longer side that is 2'.

a. What is the scale factor?

b. Use a proportion to find the length of the shorter side of the new rectangle.

5. A rectangle has been drawn for you below. To its bottom right draw a similar rectangle. The scale factor for the similar rectangles should be $\frac{4}{1}$. Be sure and label the lengths of each side of the new rectangle.



6. A rectangle has been drawn for you below. To its bottom right draw a similar rectangle. The scale factor for the two rectangles should be $\frac{2}{3}$. Be sure to label the length of each side of the new rectangles.

