

Name: Key
 Geometry

Date: _____
 Band: _____

Unit 6: Similarity Study Guide

LT#1: Write ratios and solve proportions.

1. A high school has 16 math teachers for 1856 math students. What is the ratio of math teachers to math students?

$$\frac{\text{math teachers}}{\text{math students}} = \frac{16}{1856} = \boxed{\frac{1}{116}} \quad \text{or} \quad \boxed{1:116}$$

2. The measures of two complementary angles are in the ratio 2:3. What is the measure of the smaller angle?
 $2x$

sum = 90°

$$2x + 3x = 90$$

$$2x = 2(18) = \boxed{36^\circ}$$

$$5x = 90$$

$$3x = 3(18) = 54^\circ$$

$$x = 18$$

Solve each proportion.

$$3. \frac{x}{7} = \frac{18}{21}$$

$$4. \frac{6}{11} = \frac{15}{2x}$$

$$5. \frac{x}{3} = \frac{x+4}{5}$$

$$6. \frac{8}{x+9} = \frac{2}{x-3}$$

$$21x = 126$$

$$12x = 165$$

$$5x = 3x + 12$$

$$2x + 18 = 8x - 24$$

$$\boxed{x = 6}$$

$$\boxed{x = 13.75}$$

$$2x = 12$$

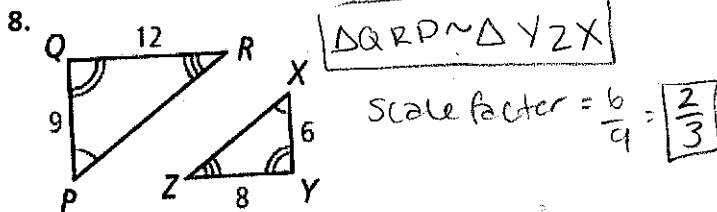
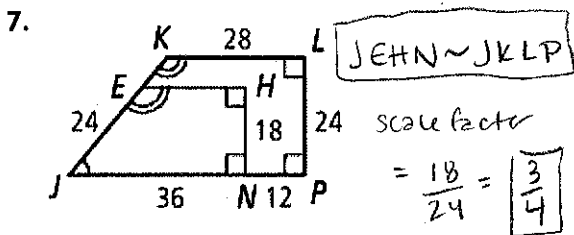
$$42 = 6x$$

$$\boxed{x = 6}$$

$$\boxed{7 = x}$$

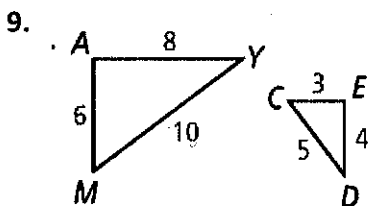
LT#2: Identify and apply similar polygons.

The polygons are similar. Write a similarity statement and give the scale factor.



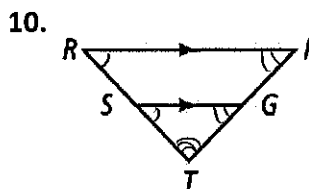
LT#3: Use the AA Similarity Postulate and the SAS Similarity and SSS Similarity Theorems.

Are the triangles similar? How do you know?



$$\frac{3}{6} = \frac{4}{8} = \frac{5}{10} = \frac{1}{2}$$

Similar; SSS~



Similar; AA~

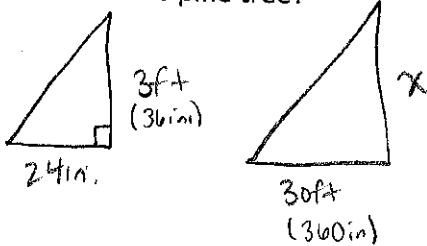
LT#4: Use similarity to find indirect measurements.

11. The length of a rectangular playground in a scale drawing is 12 in. If the scale is 1 in. = 10 ft, what is the actual length?

$$\frac{1 \text{ in}}{10 \text{ ft}} = \frac{12 \text{ in}}{x \text{ ft}}$$

$$x = 120 \text{ ft}$$

12. A 3-ft vertical post casts a 24-in. shadow at the same time a pine tree casts a 30-ft shadow. How tall is the pine tree?



$$\frac{36}{24} = \frac{x}{360}$$

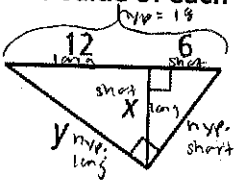
$$24x = 12960$$

$$x = 540 \text{ in.} = 45 \text{ ft}$$

LT#5: Find and use relationships in similar triangles.

Find the value of each variable. Write your answer in simplest radical form.

13.



$$\frac{6}{x} = \frac{x}{12}$$

$$x^2 = 72$$

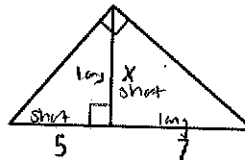
$$x = 6\sqrt{2}$$

$$\frac{12}{y} = \frac{y}{18}$$

$$y^2 = 216$$

$$y = 6\sqrt{6}$$

14.

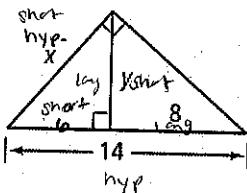


$$\frac{5}{x} = \frac{x}{7}$$

$$x^2 = 35$$

$$x = \sqrt{35}$$

15.



$$\frac{6}{y} = \frac{y}{8}$$

$$y^2 = 48$$

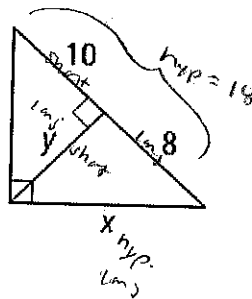
$$y = 4\sqrt{3}$$

$$\frac{6}{x} = \frac{x}{14}$$

$$x^2 = 84$$

$$x = 2\sqrt{21}$$

16.



$$\frac{10}{y} = \frac{y}{8}$$

$$y^2 = 80$$

$$y = 4\sqrt{5}$$

$$\frac{8}{x} = \frac{x}{18}$$

$$x^2 = 144$$

$$x = 12$$