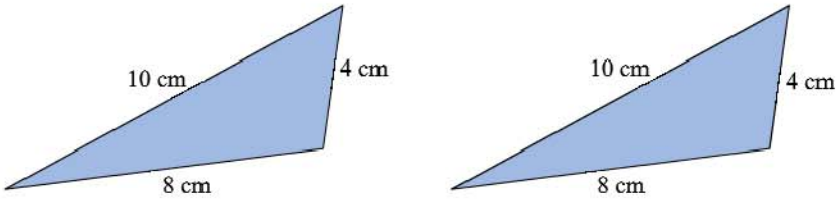
Geometry CC – Mr. Valentino Name: _____
Unit 6 Lesson 1: Introduction to Similarity Date: _____ Period: _____

The Wonderful World of SIMILARITY!

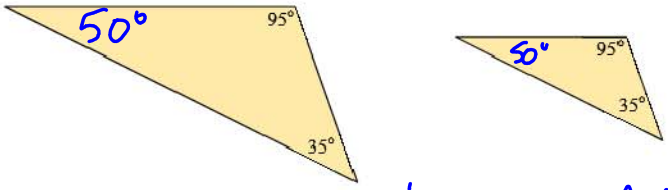
Do Now:

1. Do these triangles have to be congruent? If so, how do you know?



Yes, because we have SSS congruence.

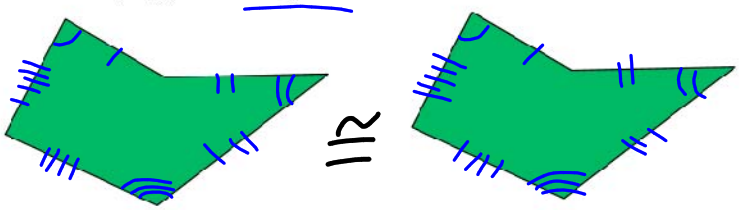
2) Do these triangles have to be congruent? If so, how do you know?



No, because AAA does NOT prove congruency.

Stop here

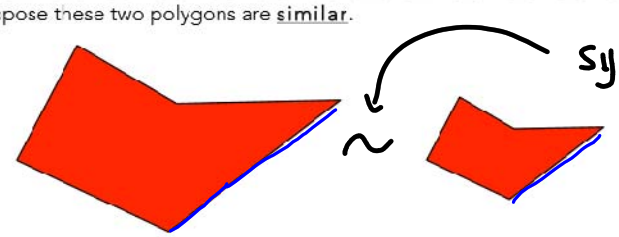
3) Suppose these two polygons are **congruent**.



4) When 2 polygons are **congruent**, corresponding angles are Congruent.

5) When 2 polygons are **congruent**, corresponding sides are congruent.

Suppose these two polygons are **similar**.



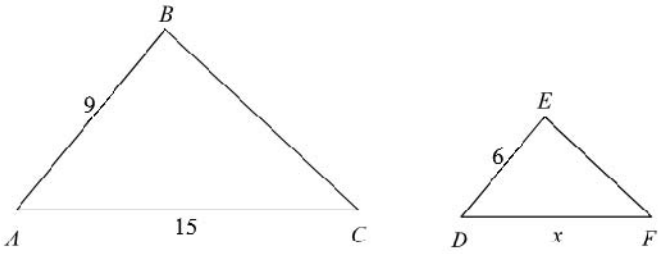
6) When 2 polygons are **similar**, corresponding angles are congruent.

7) When 2 polygons are **similar**, corresponding sides are proportional.

8) Draw the congruence symbols between the 1st set of polygons, and draw the similarity symbol between the 2nd set of polygons.

9) In the diagram below, $\Delta ABC \sim \Delta DEF$. Find the value of x:

similar

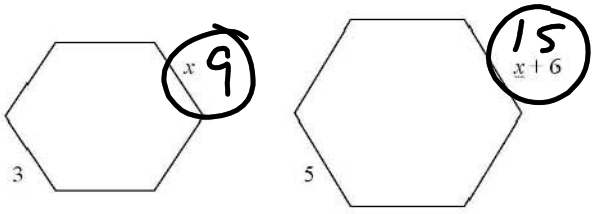


$\frac{9}{6} = \frac{15}{x}$

$\frac{9x}{9} = \frac{90}{9}$

$x = 10$

10) The two polygons below are similar, and corresponding sides are labeled. Find the value of x.



$\frac{3}{5} = \frac{x}{x+6}$

$5x = 3(x+6)$

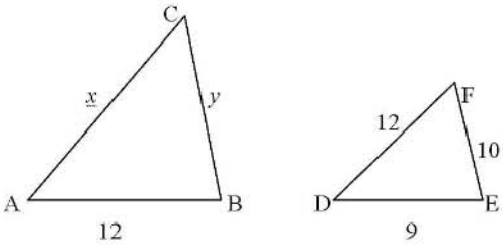
$5x = 3x + 18$

$-3x \quad -3x$

$2x = 18$

$x = 9$

11) In the diagram below, $\Delta ABC \sim \Delta DEF$. Find the values of x and y.

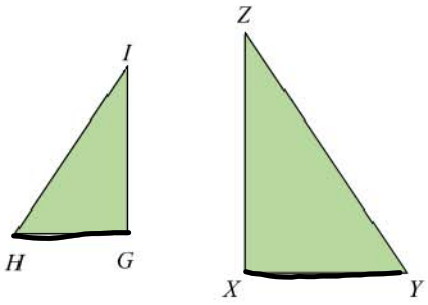


$\frac{x}{12} = \frac{12}{9}$ $\frac{y}{10} = \frac{12}{9}$

$9x = 144$ $9y = 120$

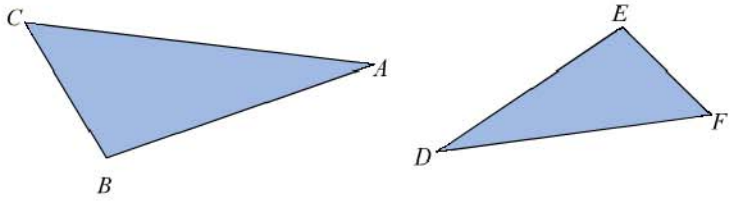
$x = 16$ $y = 13.3$

12) In the diagram below, $\Delta GHI \sim \Delta XYZ$. Write a 3-way proportion to describe the side lengths.



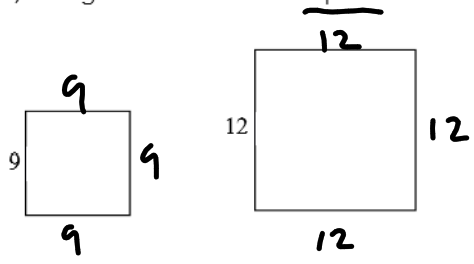
$\frac{GH}{XY} = \frac{HI}{YZ} = \frac{IG}{ZX}$

13) In the diagram below, $\Delta ABC \sim \Delta DEF$. Write a 3-way proportion to describe the side lengths.



$\frac{AB}{DE} = \frac{BC}{EF} = \frac{CA}{FD}$

14) The figure below shows two squares.



Perimeter: 36 Perimeter: 48

Area: 81 Area: 144

a] What is the ratio of their sides?

$\frac{9}{12} = \frac{3}{4}$

b] What is the ratio of their perimeters?

$\frac{36}{48} = \frac{3}{4}$

c] What is the ratio of their areas?

$\frac{81}{144} = \frac{9}{16}$

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15) Two polygons are similar. The ratio of their side lengths is $a : b$.

a] What will the ratio of their perimeters be? $a:b$ $\frac{a}{b}$

b] What will the ratio of their heights be? $a:b$ $\frac{a}{b}$

c] What will the ratio of their areas be? $a^2:b^2$ $\frac{a^2}{b^2}$

d] What will the ratio of their volumes be? $a^3:b^3$ $\frac{a^3}{b^3}$

16) If the corresponding sides of two similar polygons have lengths 2 and 5, what is the ratio of their perimeters?

$2:5$ OR $\frac{2}{5}$

17) The sides of a pentagon have lengths 4, 5, 6, 8, and 9. The perimeter of a similar pentagon is 24. Find the length of the shortest side of the second pentagon.

Perimeter of 1st pentagon-32

Perimeter of 2nd pentagon-24

$\frac{x}{4} = \frac{24}{32}$

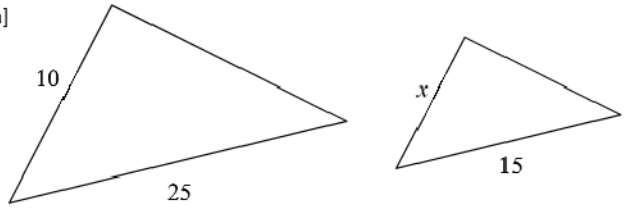
$\frac{32x}{32} = \frac{96}{32}$

$x = 3$

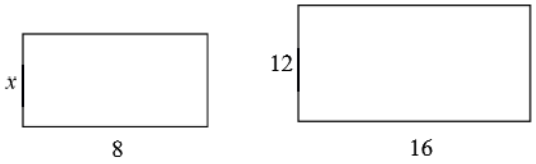
18) The sides of a triangle have lengths 6, 8, and 10. What is the length of the shortest side of a similar triangle whose perimeter is 18?

19) Each instance shows two similar polygons with corresponding parts labeled. Find the value of x in each case.

a]

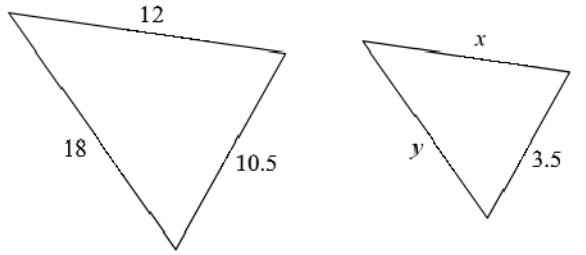


b]

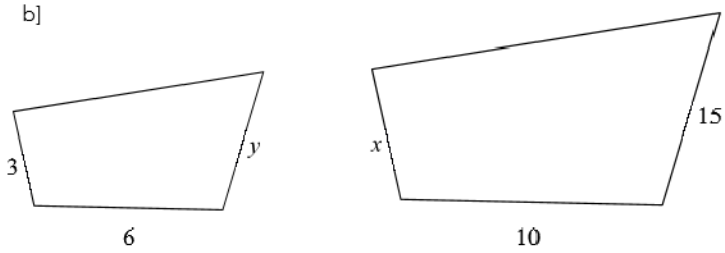


20) Each instance shows two similar polygons with corresponding parts labeled. Find the values of x and y in each case.

a]



b]



21) A rectangle is 3.2 centimeters wide and 8 centimeters long. A similar rectangle is 5 centimeters long. What is the width of the second rectangle?