Similarity Study Guide

Name: ______________________________________

Class: _____________________ Date: ___________

State the three triangle similarity theorems:

1. ___________________________ 2. ____________________________ 3. _____________________________

Draw two triangles that demonstrate each of the similarity theorems (label as needed):

1.

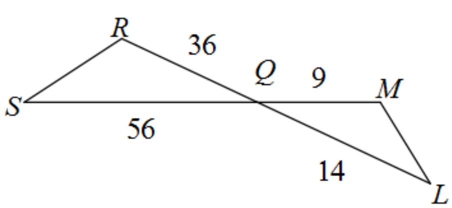
2.

3.

SCALE FACTOR (SF): If two shapes are similar, there will be a SCALE FACTOR that determines the relationship between the two shapes. This scale factor is defined as the value that, when multiplied by all aspects of a pre-image, can be used to determine all aspects of the image of that pre-image. In other words, the image divided by the pre-image gives you the scale factor!

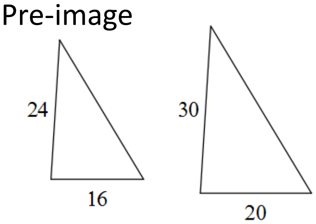
$$SF = \frac{Image}{Pre{-}Image}$$

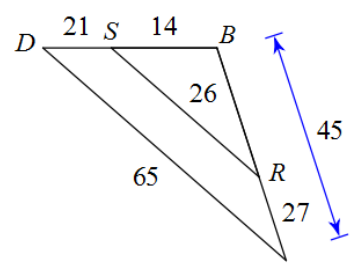
Find the SCALE FACTOR between the following images:



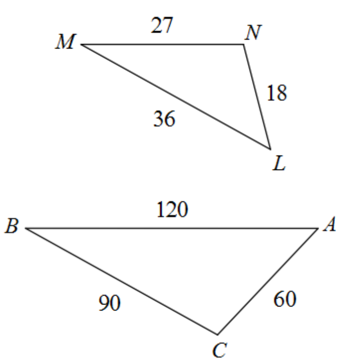
PRQ is the pre-image

Pre-image



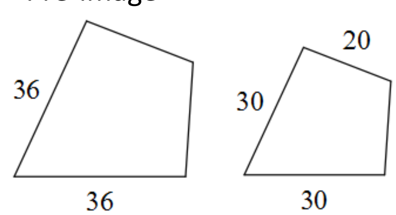


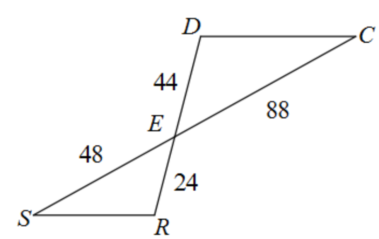
SBR is the pre-image



MNL is the pre-image

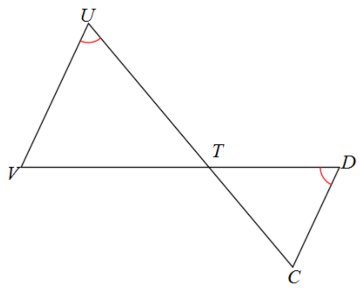
Pre-image

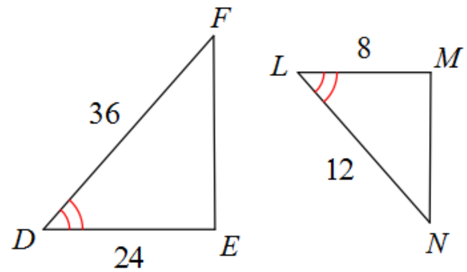


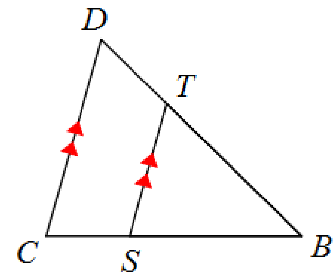


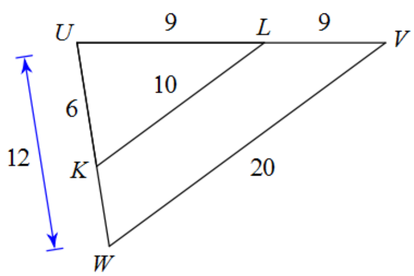
SER is the pre-image

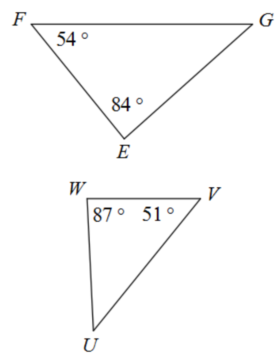
Are these triangles similar? Use what you know about similarity theorems and scale factors to determine if the following triangles are similar. If they are, state the relevant similarity theorem.

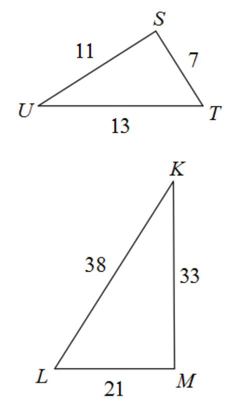






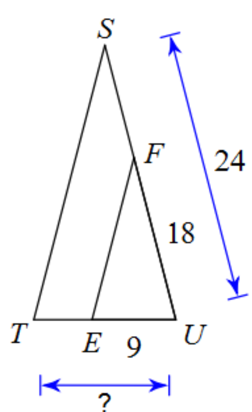




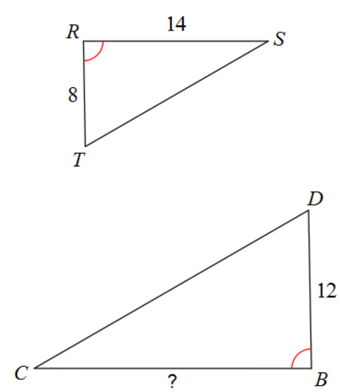


Using SCALE FACTOR to find the missing length. Determine the scale factor between each pair of triangles, and use that scale factor to find the missing side length. **ASSUME THE SMALLER TRIANGLE IS THE PRE-IMAGE.**

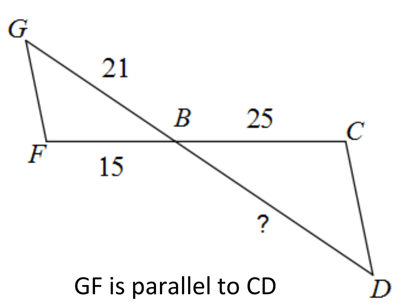
SF __________
? __________



SF __________
? __________

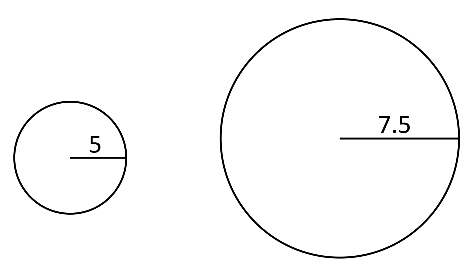


SF __________
? __________



GF is parallel to CD

SF __________



Dilations and Scale Factor.

Dilating on a coordinate plane is nothing more than applying a scale factor to the coordinates of each vertex of a shape. Therefore, the scale factor and the coordinate rule for dilations is THE SAME THING!

Example – Dilating with a scale factor of 1.5 is written as: (x , y) → (1.5x , 1.5y)

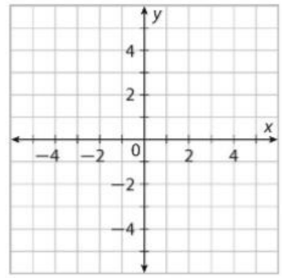
Try the following two dilations:

$D(x, y) \rightarrow (3x, 3y)$

Preimage: $P(1, -1)$, $Q(2, 1)$, $R(-2, 1)$

Image: P'(___, ___), Q'(___, ___), R'(___, ___)

Scale factor: _____

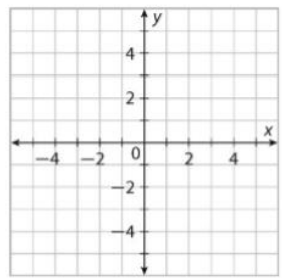


$D(x, y) \rightarrow (2x, 2y)$

Preimage: $X(3, 1)$, $Y(-2, 3)$, $Z(2, -1)$

Image: X'(___, ___), Y'(___, ___), Z'(___, ___)

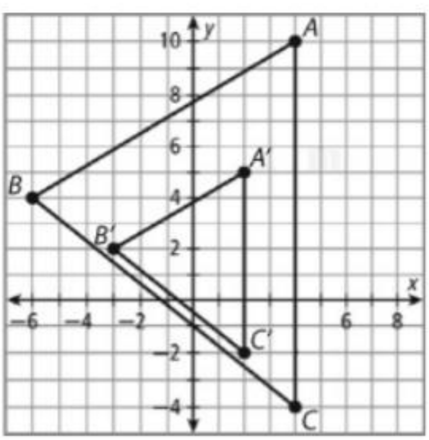
Scale factor: _____

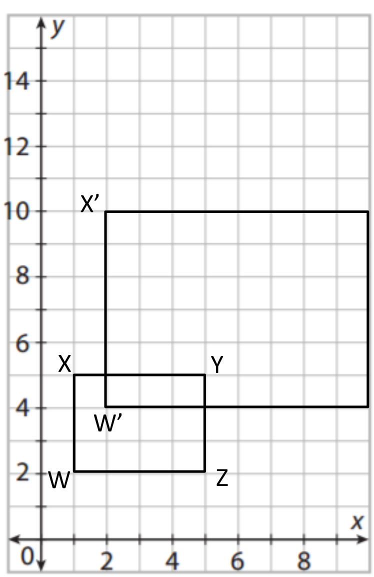


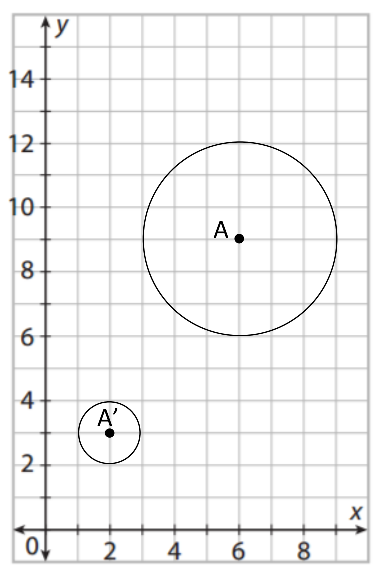
What is the **CENTER OF DILATION** for the previous two problems? ______________________________

Figuring out the SCALE FACTOR by observing a dilation.

When a pre-image is dilated to create an image, the two shapes will have a ______________ that can be multiplied by every aspect of the pre-image to discover every aspect of the image. Use this information to discover the scale factor between the following images on the coordinate plane *(be careful identifying the pre-image and image!)*







SF = $\frac{Image}{Pre-Image}$ = [ ]

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Using Proportions to Determine Missing Lengths

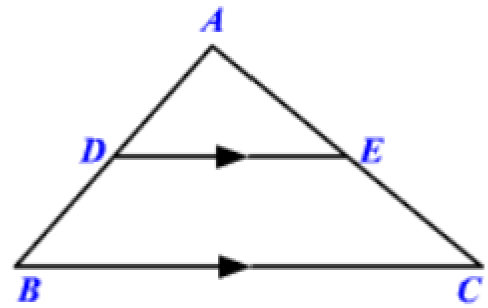
Complete each proportion:

$\frac{AD}{DB} =$

$\frac{AC}{AE} =$

$\frac{EC}{AC} =$

$\frac{AD}{DE} =$



The sun is shining on a 6 ft. tall person, casting a 3 ft. shadow on the ground. A building that is 120 ft. tall is also casting a shadow. What is the length of the building's shadow?

Draw the picture to model the ratio, create the ratio and solve.

The sun is shining on a tree that is 20 ft. tall, casting a 14 ft. shadow. If a 4 ft. tall shrub is also casting a shadow, what would the length of the shadow be?

Draw the picture to model the ratio, create the ratio and solve.