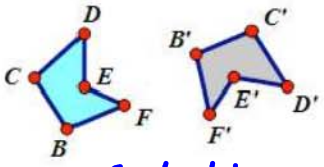
Geometry CC – Mr. Valentino
Unit 4 Lesson 8: Identifying Compositions

Name: _____
Date: _____ Period: _____

It is important to take some time to identify the properties of the images that are being rotated, reflected, translated, or a combination of the three.

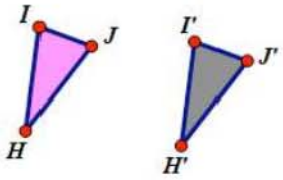
An ____ISOMETRY____ (RIGID MOTION) is a transformation that **preserves** the distances and/or angles between the pre-image and image.

Example #1



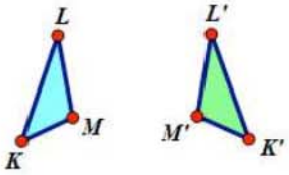
rotation

Example #2



translation

Example #3



reflection

Definition: ___orientation___ (lettering): The lettering of the points of the pre-image, in this diagram, is clockwise *A-B-C*, while the image is lettered counterclockwise *A'-B'-C'*. When lettering changes direction, in this manner, the transformation is referred to as a *non-direct* or *opposite isometry*.

Properties preserved under a line reflection from the pre-image to the image.

1. **distance** (lengths of segments remain the same)
2. **angle measures** (remain the same)
3. **parallelism** (parallel lines remain parallel)
4. **collinearity** (points remain on the same lines)

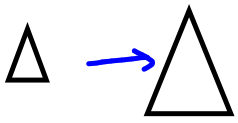
The **orientation** (lettering around the outside of the figure), is not preserved. The order of the lettering in a reflection is reversed (from clockwise to counterclockwise or vice versa).

Direct isometry → orientation is preserved

Opposite isometry → orientation is NOT preserved

Properties preserved under a **translation** from the pre-image to the image.	Properties preserved under a **rotation** from the pre-image to the image.
1. distance (lengths of segments remain the same)	**1. distance** (lengths of segments remain the same)
2. angle measures (remain the same)	**2. angle measures** (remain the same)
3. parallelism (parallel lines remain parallel)	**3. parallelism** (parallel lines remain parallel)
4. collinearity (points remain on the same lines)	**4. collinearity** (points remain on the same lines)
5. orientation (lettering order remains the same)	**5. orientation** (lettering order remains the same)

★ Dilation → a transformation that produces an image that is the same shape as the original, but is a different size



★ NOT an isometry, but orientation IS preserved

Directions: Fill in the chart with the coordinates of the image after each transformation. Then write the transformations as a composition of transformations. MAKE SURE TO LABEL WITH PRIMES!

Ex: Reflect over the y-axis. Rotate 180°. Translate (x,y) →(x-3, y+1) —> $T_{-3,1} \circ R_{O,180°} \circ r_{y\text{-axis}}$

1. Pre-image: A(0,0), B(8,1), C(5,5)

Rotate the figure 180°	A'(0,0) B'(-8,-1) C'(-5,-5)
Reflect the figure over the x-axis	A''(0,0) B''(-8,1) C''(-5,5)
Translate the figure according to (x,y)→(x+6,y-1)	A'''(6,-1) B'''(-2,0) C'''(1,4)
Composition of transformations	$T_{(6,-1)} \circ r_{x\text{-axis}} \circ R_{0,180°}$