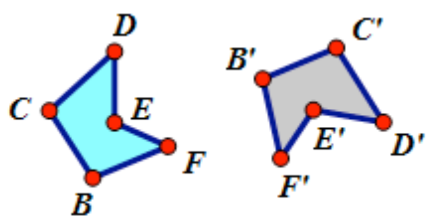
Geometry CC – Mr. Valentino
Unit 4 Lesson 8: Identifying Compositions

Name: ______________________________
Date: ____________________ Period: _____

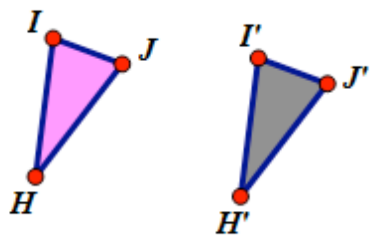
It is important to take some time to identify the properties of the images that are being rotated, reflected, translated, or a combination of the three.

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

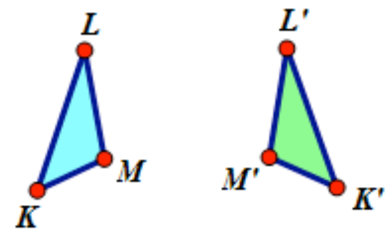
Example #1



Example #2



Example #3



Definition: ___________________ (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).

Properties preserved under a **translation** 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)
5. **orientation** (lettering order remains the same)

Properties preserved under a **rotation** 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)
5. **orientation** (lettering order remains the same)

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°	
Reflect the figure over the x-axis	
Translate the figure according to (x,y)→(x+6,y-1)	
Composition of transformations	

2. Pre-image: D(-12,6), E(-4,6), F(-6,9), G(-10,9)

Translate the figure according to $(x,y)\rightarrow(x+1,y-6)$	
Reflect the figure over the x-axis	
Reflect the figure over the y-axis	
Composition of transformations	

3. Pre-image: H(2,2), I(-2,2), J(-2,-2), K(2,-2)

Rotate the figure 180°	
Translate the figure according to $(x,y)\rightarrow(x+2,y+2)$	
Reflect the figure over the line $y = x$	
Composition of transformations	

4. Pre-image: L(7,2), M(0,9), N(-6,-5), P(1,-12)

Reflect the figure over the y-axis	
Reflect the figure over the x-axis	
Rotate the figure 90° clockwise about the origin	
Composition of transformations	

5. Pre-image: Q(0,0), R(-13,0), S(0,12)

Rotate the figure 270° clockwise about the origin	
Translate the figure according to (x,y)→(x+5,y+5)	
Composition of transformations	

6. Pre-image: T(6,-3), U(8,-5), V(7,-7), W(5,-7), X(4,-5)

Translate the figure according to (x,y)→(x-4,y+3)	
Reflect the figure over the line $y = x$	
Rotate the figure 180°	
Composition of transformations	