

Name \_\_\_\_\_ Per \_\_\_\_\_



LO: I can construct centers of rotation.  
I can use function notation to describe rotations in the plane.

**DO NOW** On the back of this packet

(1) **Center of Rotation**

internet

Use the GeogebraTube link to explore centers of rotation with the guidance below.

We know from lesson 2.1R that a preimage point and its image are \_\_\_\_\_ from the center of rotation. We can use that to devise a way to construct centers of rotation.

(a) Drag point C to change the angle of rotation. As  $D'E'F'$  rotates, what shape does D' make as it moves? \_\_\_\_\_  
To check your answer, check the box to show rotation path for D. Repeat by watching E' and F'. What shape is always made as a point is rotated? \_\_\_\_\_

(b) Show all three rotation paths. Is the center of rotation going to be the same for all three circular paths that you described in part (a)? Now we will need to figure out how we can construct that center.

(c) Check the boxes to show segment  $DD'$  and the perpendicular bisector of  $DD'$ . Is every point on the perpendicular bisector equidistant from D and D'? \_\_\_\_\_ Do you think the center of rotation will have to be on this perpendicular bisector? \_\_\_\_\_ Verify your answer by checking the "Show point" box.

(d) Uncheck the boxes for show point,  $DD'$  and the perpendicular bisector of  $DD'$  and repeat the process in part (c) for  $EE'$  and  $FF'$ .

(e) Was the center of rotation on all 3 perpendicular bisectors? \_\_\_\_\_ Show all three perpendicular bisectors and the center of rotation. The center of rotation is located where \_\_\_\_\_  
\_\_\_\_\_. This makes sense because the center of rotation must be \_\_\_\_\_ from each preimage and its corresponding image, and \_\_\_\_\_ points on a perpendicular bisector are \_\_\_\_\_ from the endpoints of the segment it bisects.

**SUMMARY:**

**The center of rotation that maps a figure to its rotated image is located at the**

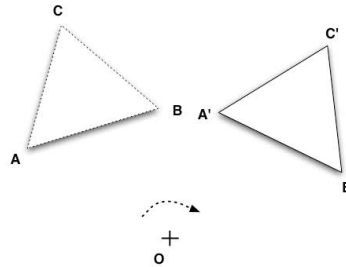
\_\_\_\_\_ of the \_\_\_\_\_ of the

**segments connecting each preimage point to its corresponding image point.**

**Constructing \_\_\_\_\_ perpendicular bisectors is enough to locate the center of rotation.**

(2) **Rotations notes** Complete the reflection notes on page N9  
 N9 Notation:

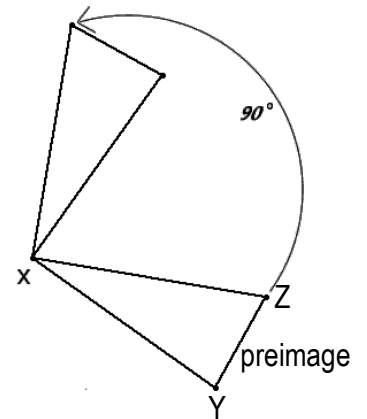
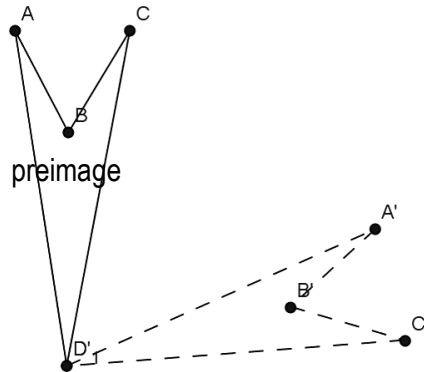
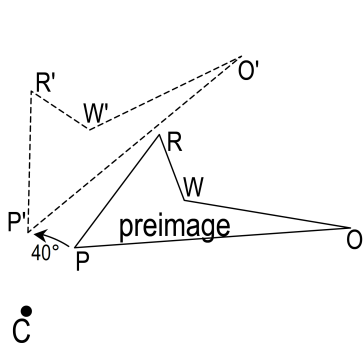
**R** \_\_\_\_\_, \_\_\_\_\_ ( \_\_\_\_\_ )



The angle of rotation is named by points in the order:  
**preimage to center of rotation to image**

Name the angle of rotation at right in 3 ways \_\_\_\_\_ or \_\_\_\_\_ or \_\_\_\_\_

(3) **Rotations** Demonstrate rotations of the plane with transparencies and dry erase markers and name them with function notation. Use function notation to describe each rotation. Verify that each diagram illustrates a rotation by tracing the original figure and rotating according to the function notation that you have written.



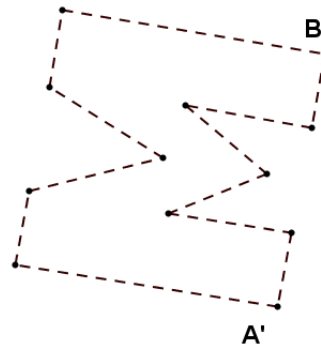
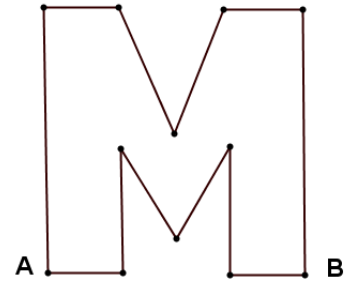
Function: \_\_\_\_\_ Function: \_\_\_\_\_ Function: \_\_\_\_\_

I know that all three of these are rotation functions because (1) a rotation function is \_\_\_\_\_

and (2) when I traced and rotated each figure, \_\_\_\_\_

(4) **Rotations** Find the center of rotation  
N8-N9  
Sort cards

- (a)  Draw a segment connecting points \_\_\_\_\_.
  - (b)  Using a compass and straightedge, construct the perpendicular bisector of this segment.
  - (c)  Draw a segment connecting points \_\_\_\_\_.
  - (d)  Construct the perpendicular bisector of this segment.
  - (e)  Label the point where the perpendicular bisectors intersect point C.
  - (f)  Point C is the \_\_\_\_\_  
\_\_\_\_\_
- (Use tracing paper to check the rotation)

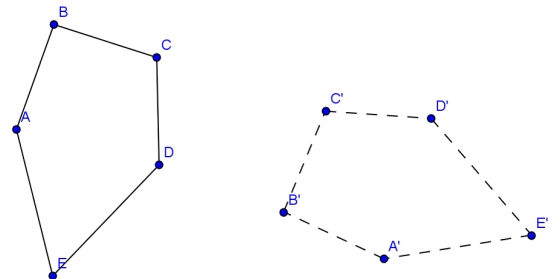
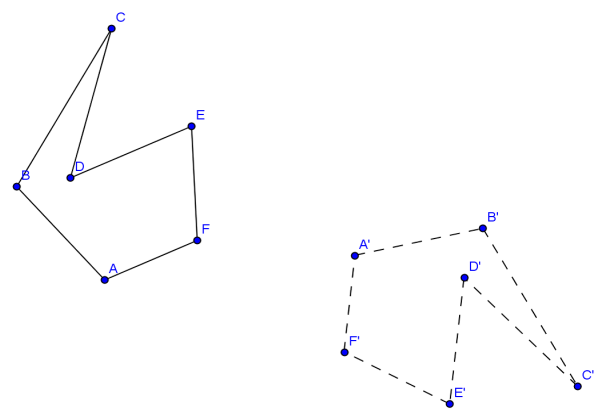


(g) Write the rotation function: \_\_\_\_\_ (name the angle of rotation)

(5) **Rotations** Find the center of rotation  
N8-N9  
Sort cards  
For each preimage/image pair, construct the center of rotation and label it X.

(a)

(b)



Rotation notation \_\_\_\_\_

Rotation notation: \_\_\_\_\_

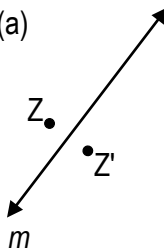
(6) **BIG IDEA:** To construct a center of rotation, I need to construct at least two \_\_\_\_\_ of segments that connect a \_\_\_\_\_ to its \_\_\_\_\_ and mark the location where the two \_\_\_\_\_ intersect. This point of intersection is the \_\_\_\_\_.

(7) **Exit Ticket**  
ON THE LAST PAGE

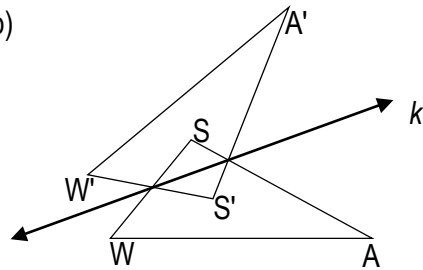
(8) **Homework**  
compass

(1) Describe each reflection with function notation.

(a)



(b)



(2) Does the diagram at right show a triangle and its reflection across the line between them? \_\_\_\_\_ Describe how you know:

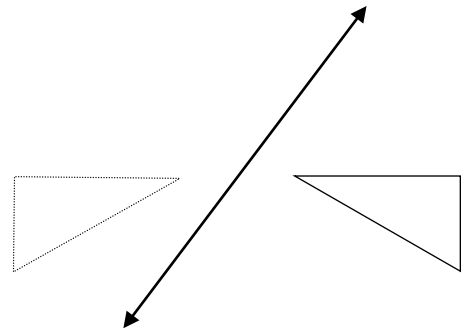
\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



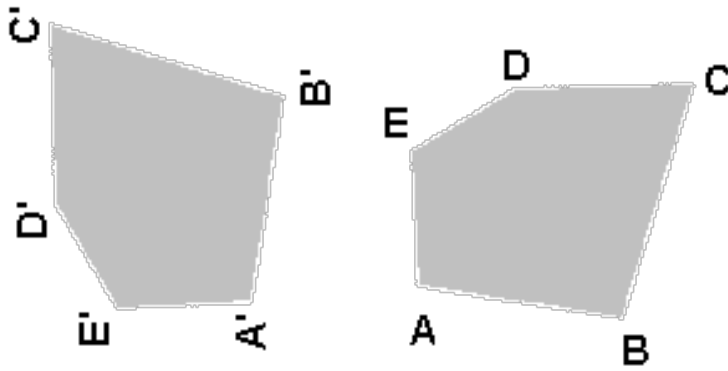
(3) Sketch each of the following: (SEE NOTES)

(a)  $\overline{QR} \perp \vec{ST}$

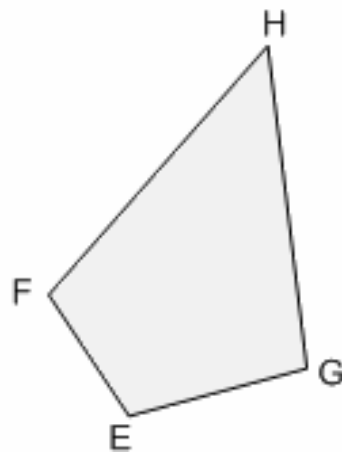
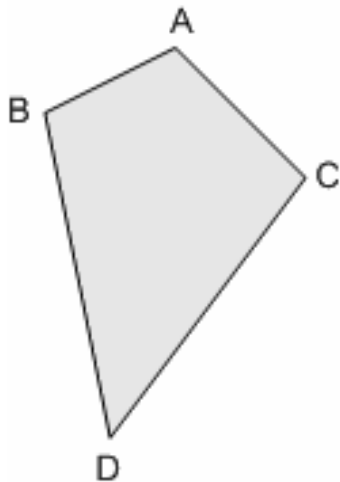
(b)  $\vec{VW}$  bisects  $\overline{XY}$

(c)  $\angle LMN \cong \angle OPQ$

- (8) **Homework (continued)** (compass and straightedge for all constructions)  
compass
- (4) Construct the center of rotation and label it Z



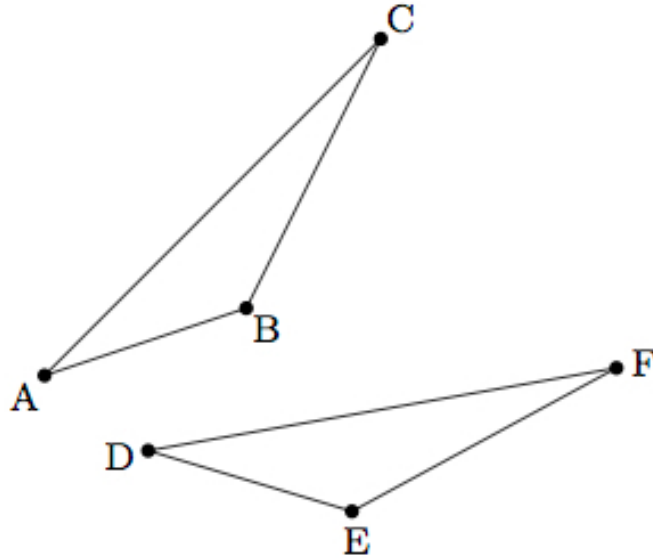
- (4) Construct the center of rotation and label it Z  
First, figure out which vertices are corresponding  
(letter A maps to letter \_\_\_\_, B to \_\_\_\_, C to \_\_\_\_, D to \_\_\_\_).





(1) The LO (Learning Outcomes) are written below your name on the front of this packet. Demonstrate your achievement of these outcomes by doing the following:

- (a) Use a compass and straightedge to construct the center of rotation that maps triangle ABC to triangle DEF. Label the center of rotation O.



- (b) Name the angle of rotation for the construction in part (a). \_\_\_\_\_

- (c) Write the function notation for the rotation you did in part (a). \_\_\_\_\_

- (1) (a) Draw  $\overline{AB}$  with midpoint M. (b) Draw  $\angle TVS$  with vertex V.

(2) Is vertex V a midpoint? How do you know? Is midpoint M also a vertex? How do you know?

(3) What word is written below? When you turn your paper upside-down, what does the word say?

How does this relate to today's Learning Objective (LO)?