

Name: _____

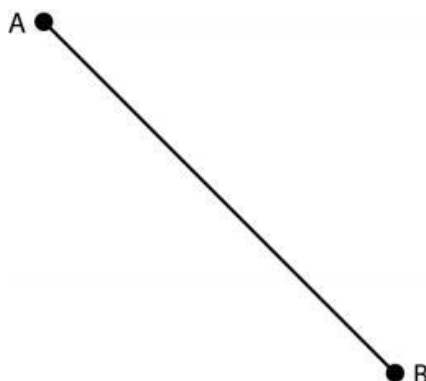
Date: _____

UNIT 2

LESSON 6

AIM: HOW DO WE IDENTIFY/CONSTRUCT THE CENTER OF ROTATION OFF THE COORDINATE PLANE?

Do Now: Construct the perpendicular bisector for the segment below.

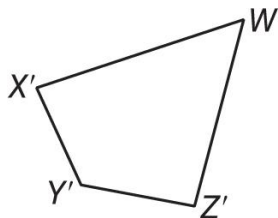
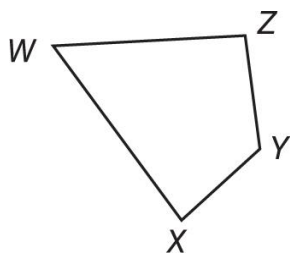


HOW DO WE FIND THE CENTER OF ROTATION OFF THE COORDINATE PLANE?

- (1) Pick any point and its mapping point.
- (2) Construct the perpendicular bisector.
- (3) Repeat steps 1 & 2.
- (4) The center of rotation is the point of intersection of the perpendicular bisectors. Label this point P.
- (5) Identify the angle of rotation and determine if the rotation is either clockwise or counterclockwise.

Example #1: Given the diagram below:

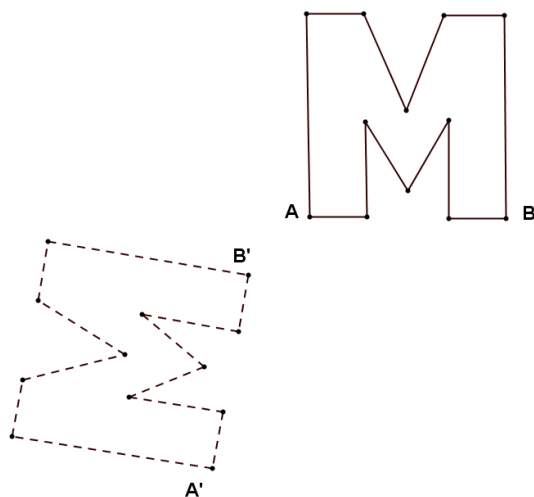
- (a) Construct the center of rotation and label the point P.



- (a) Draw the angle of rotation.
(b) Which direction is the rotation? _____

Example #2: Construct the center of rotation that maps M onto M'

(a) Construct the center of rotation and label the point P.



(b) Draw the angle of rotation.

(c) Which direction is the rotation? _____

PROPERTIES PRESERVED UNDER A ROTATION:

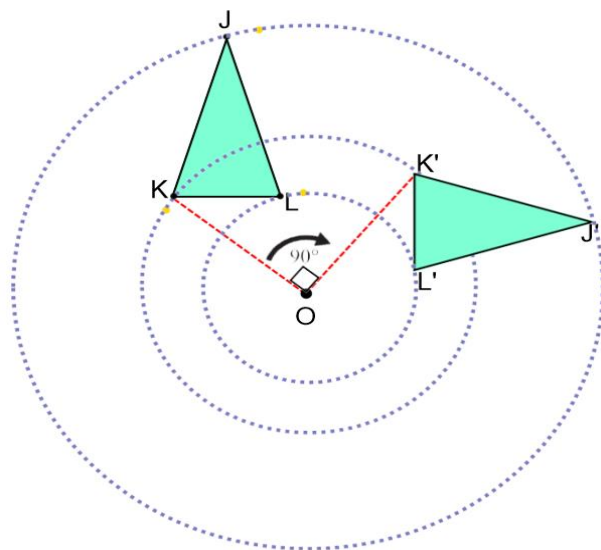
1. **DISTANCE** (lengths of segments are the same)
2. **ANGLE MEASURE** (angles stay the same)
3. **ORIENTATION** (lettering order remains the same)
4. **PARALLELISM** (things that were parallel are still parallel)
5. **COLINEARITY** (points on a line, remain on the line)

To describe a ROTATION, three facts are needed:

1. _____
2. _____
3. _____

Example #1: Given the diagram below:

- A. What point represents the center of rotation? _____
- B. What is the angle of rotation? _____
- C. Which direction is the rotation? _____



Example #2: The diagram below shows a rotation of θ degrees was performed on $\triangle ABC$ to create $A'B'C'$.

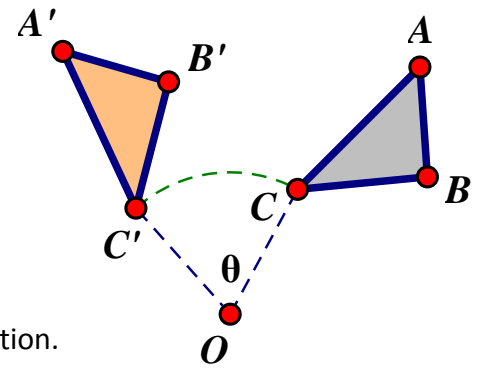
a) Pre-image is: _____ . Image is: _____ .

b) What is the center of rotation? _____

c) What is the angle of rotation? _____

d) Which direction is the rotation? _____

e) If $m\angle A = 52^\circ$ and $m\angle C' = 40^\circ$ find the measure of $\angle B'$. **Explain** your solution.



Example #3: Triangle MNP is the image of triangle JKL after a 120° counterclockwise rotation about point Q .

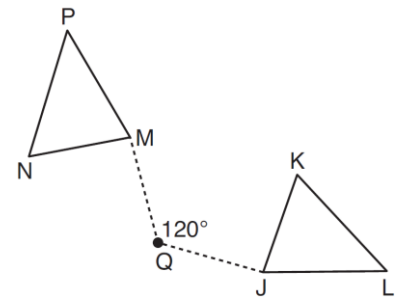
a) Pre-image is: _____ . Image is: _____ .

b) What is the center of rotation? _____

c) What is the angle of rotation? _____

d) Which direction is the rotation? _____

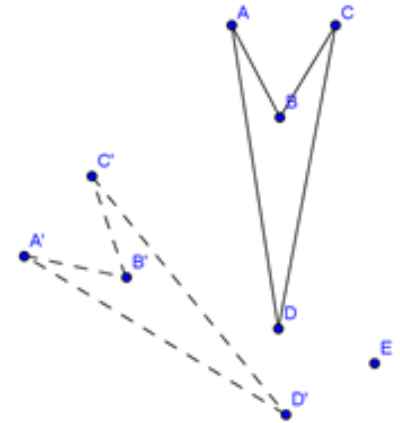
e) If the measure of angle L is 47° and the measure of angle N is 57° , determine the measure of angle M . **Explain** how you arrived at your answer.



****If the angle of rotation is *not* indicated, connect two mapping points to the _____ and draw the angle****

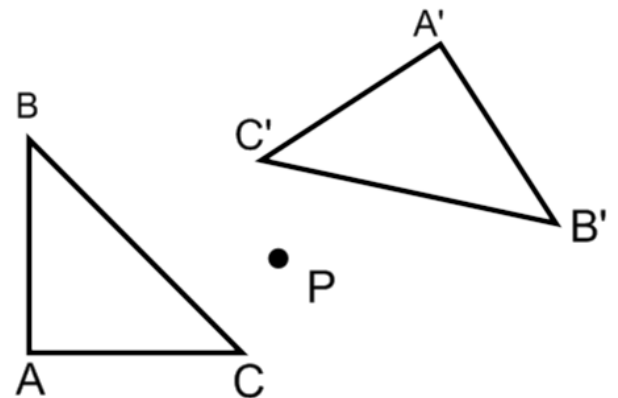
Example # 1: Given the diagram below, draw the angle of rotation.

- What is the pre-image? _____
- What is the image? _____
- What is the center of rotation? _____
- Which direction is the rotation? _____
- Are these figures congruent? **Explain.**



Example #2: Given the diagram below, draw the angle of rotation.

- What is the pre-image? _____
- What is the image? _____
- What is the center of rotation? _____
- Which direction is the rotation? _____
- Are these figures congruent? **Explain.**



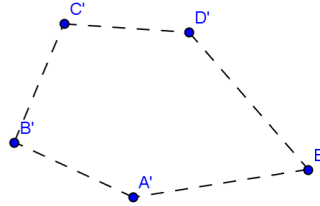
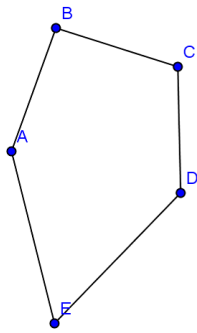
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UNIT 2

LESSON 6 HOMEWORK

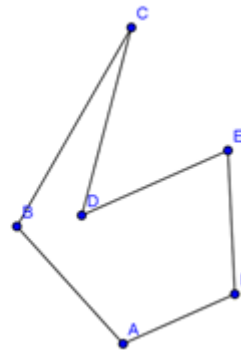
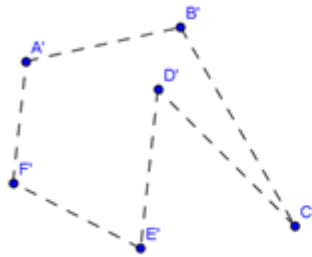
1. Construct the center of rotation, P that maps $ABCDE$ onto $A' B' C' D' E'$.



- (A) Draw the angle of rotation.
- (B) Which direction is the rotation? _____
- (C) Are these figures congruent? **Explain.**

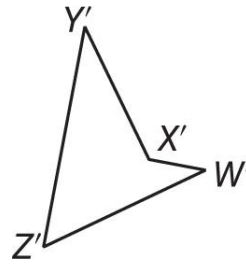
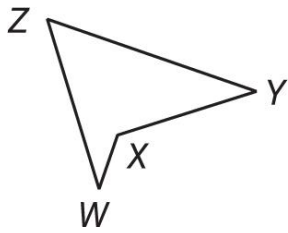
2. Construct the center of rotation, P that maps $ABCDEF$ onto $A' B' C' D' E' F'$.

(a)



- (D) Draw the angle of rotation.
- (E) Which direction is the rotation? _____
- (F) Are these figures congruent? **Explain.**

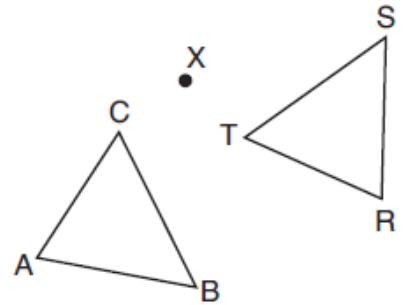
3. Given the diagram below, construct the center of rotation, P for the rotation that maps $WXYZ$ onto $W'X'Y'Z'$.



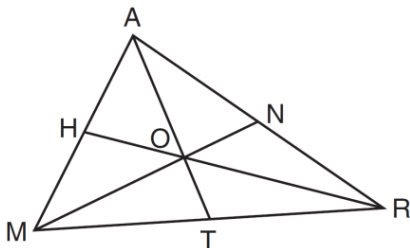
- (A) Draw the angle of rotation.
 (B) Which direction is the rotation? _____
 (C) Are these figures congruent? **Explain.**

4. After a counterclockwise rotation about point X , scalene triangle ABC maps onto $\triangle RST$, as shown in the diagram below. Which statement must be true?

- 1) $\angle A \cong \angle R$
- 2) $\angle A \cong \angle S$
- 3) $\overline{CB} \cong \overline{TR}$
- 4) $\overline{CA} \cong \overline{TS}$



5. In the diagram below of $\triangle MAR$, medians \overline{MN} , \overline{AT} , and \overline{RH} intersect at O . If $AO = 17$, what is the length of \overline{TA} ?



6.

In the accompanying diagram, $\overleftrightarrow{ABC} \parallel \overleftrightarrow{DEF}$ and $\overline{BE} \cong \overline{BF}$. If $m\angle CBF = 40$, find $m\angle BED$.

