

Name: Key

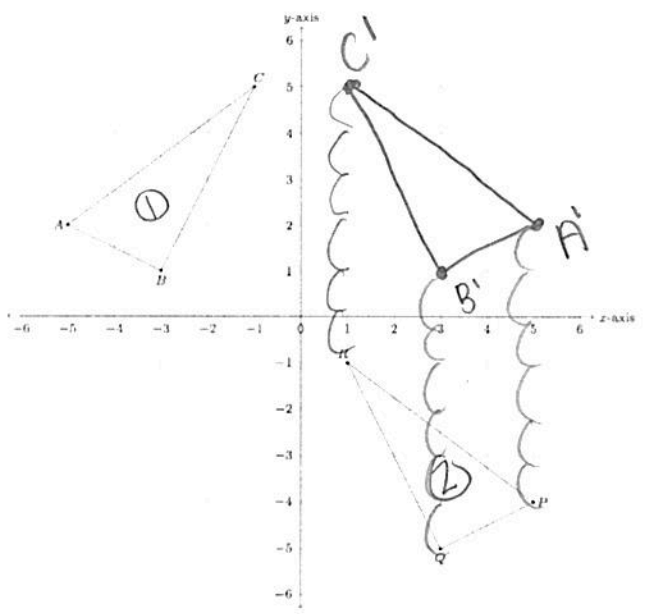
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UNIT 4

LESSON 8

AIM: HOW DO WE IDENTIFY SEQUENCES OF RIGID MOTIONS ON THE COORDINATE PLANE?

Do Now: How does triangle ABC map onto triangle PQR?



A reflection over the x-axis followed by a translation of down 6 units

\* A **sequence of rigid motions** is when it takes **more than one transformation** to map the pre-image onto the image! \*

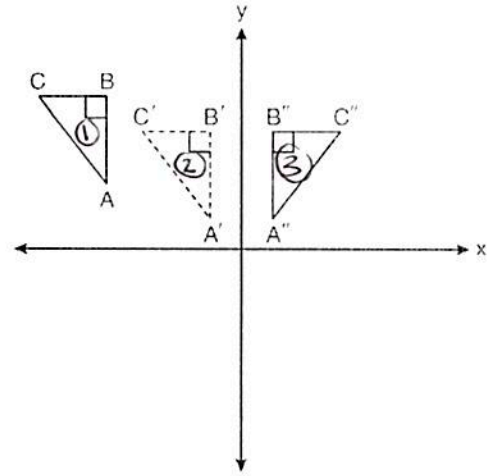
WHAT DO WE NEED TO SAY WHEN DISCUSSING TRANSFORMATIONS?

TYPE	KEY WORD / KEY FACTS TO DISCUSS WHEN DESCRIBING	DIAGRAM
1. TRANSLATION	<ul style="list-style-type: none"> <li>• <u>SLIDE!</u> (shapes face same way)</li> <li>• up, down, left, right units</li> <li>• VECTORS (off coordinate plane)</li> </ul>	
2. REFLECTION	<ul style="list-style-type: none"> <li>• <u>FLIP!</u> (orientation changes)</li> <li>• Line of reflection</li> </ul>	
3. ROTATION	<ul style="list-style-type: none"> <li>• <u>TURN!</u> (orientation stays same)</li> <li>• center of rotation</li> <li>• DIRECTION (cw/ccw)</li> <li>• Angle of rotation (if possible!)</li> </ul>	

1. In the diagram below,  $\triangle A'B'C'$  is a transformation of  $\triangle ABC$ , and  $\triangle A''B''C''$  is a transformation of  $\triangle A'B'C'$ .

The composite transformation of  $\triangle ABC$  to  $\triangle A''B''C''$  is an example of a

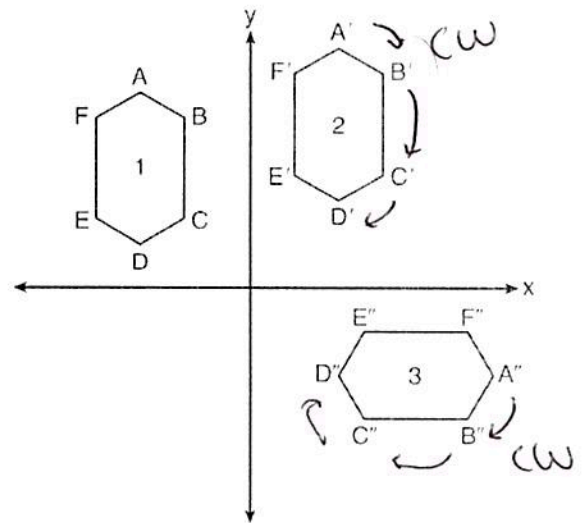
- 1) reflection followed by a rotation
- 2) reflection followed by a translation
- 3) translation followed by a rotation
- 4) translation followed by a reflection



2. In the diagram below, congruent figures 1, 2, and 3 are drawn.

Which sequence of transformations maps figure 1 onto figure 2 and then figure 2 onto figure 3?

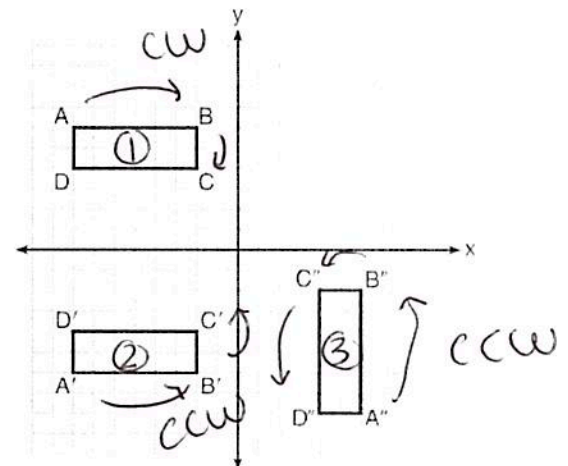
- 1) a reflection followed by a translation
- 2) a rotation followed by a translation
- 3) a translation followed by a reflection
- 4) a translation followed by a rotation



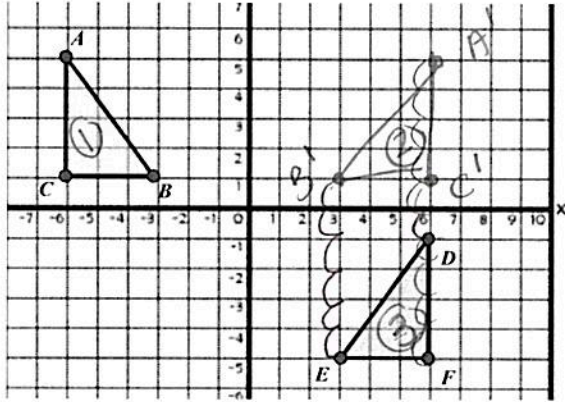
3. A sequence of transformations maps rectangle  $ABCD$  onto rectangle  $A''B''C''D''$ , as shown in the diagram below.

Which sequence of transformations maps  $ABCD$  onto  $A'B'C'D'$  and then maps  $A'B'C'D'$  onto  $A''B''C''D''$ ?

- 1) a reflection followed by a rotation
- 2) a reflection followed by a translation
- 3) a translation followed by a rotation
- 4) a translation followed by a reflection

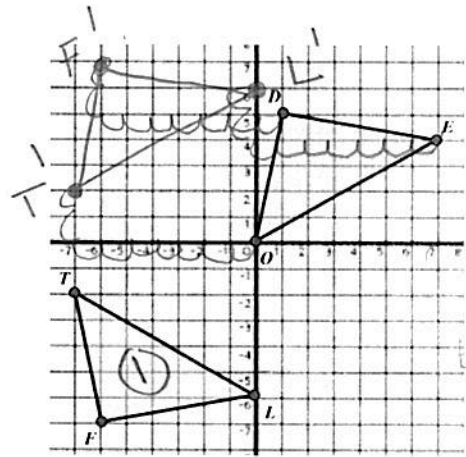


4. Name the transformation or sequence of transformations that maps one figure onto the other. Then, complete the congruence statement.



a) Given:  $\triangle ABC$  is the pre-image

A reflection over the y-axis  
 followed by  
 A translation of down 6 units  
 $\triangle ABC \cong \triangle DEF$

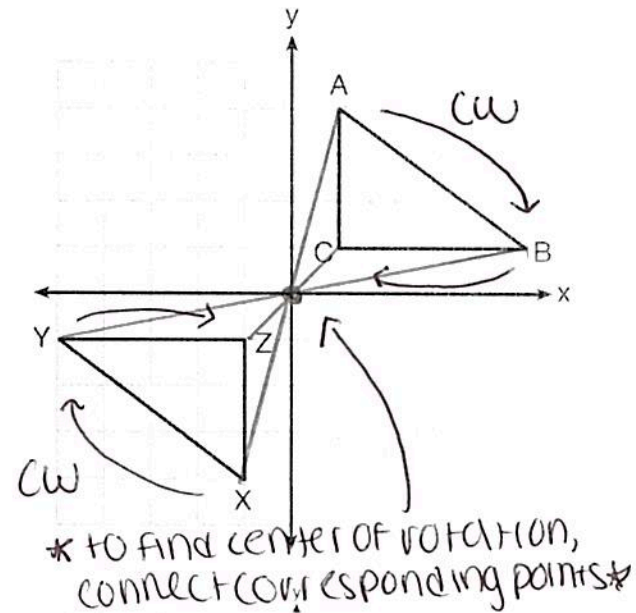


b) Given:  $\triangle FLT$  is the pre-image

A reflection over the x-axis  
 followed by  
 A translation of down 2, right 7  
 $\triangle FLT \cong \triangle DEO$

5. In the diagram below,  $\triangle ABC$  and  $\triangle XYZ$  are graphed.  
 Describe the transformation that maps  $\triangle ABC$  onto  $\triangle XYZ$ .  
 Use the properties of rigid motions to explain why  $\triangle ABC \cong \triangle XYZ$ .

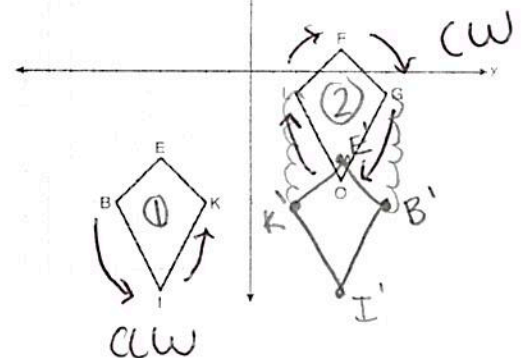
A ROTATION of  $180^\circ$  about the  
 origin.  $\triangle ABC \cong \triangle XYZ$  b/c a rotation  
 is a rigid motion which preserves  
 distance & measure



6. Quadrilaterals  $BIKE$  and  $GOLF$  are graphed on the set of axes below.

Describe a sequence of transformations that maps quadrilateral  $BIKE$  onto quadrilateral  $GOLF$ .

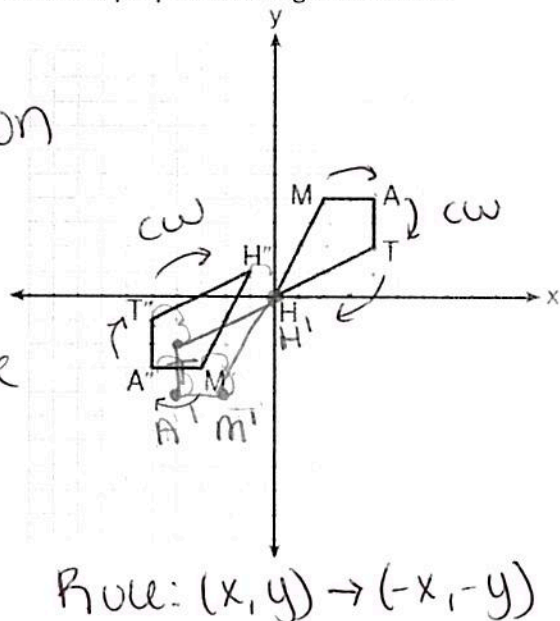
A REFLECTION over the y-axis  
 followed by a translation of  
 UP 5 units.



7. Quadrilateral  $MATH$  and its image  $M''A''T''H''$  are graphed on the set of axes below. Describe a sequence of transformations that maps quadrilateral  $MATH$  onto quadrilateral  $M''A''T''H''$ . Use the properties of rigid motion to explain your answer.

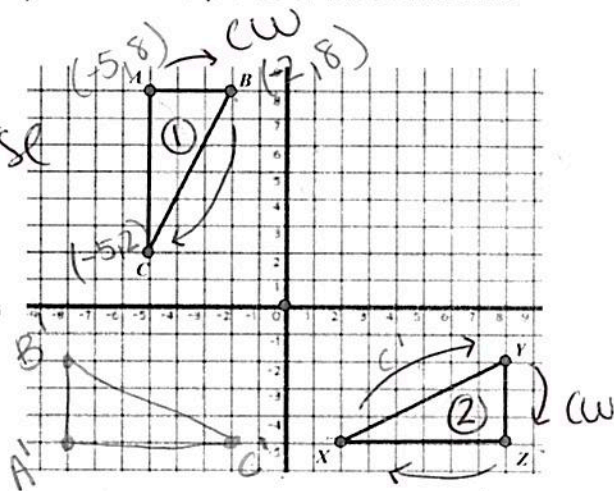
A ROTATION of  $180^\circ$  about the origin followed by a translation of up 1 unit, left one unit.

Quad.  $MATH \cong$  Quad.  $M''A''T''H''$   
 b/c rotations + translations are rigid motions which preserve distance +  $\angle$  measure



8. Triangle  $ABC$  and its image  $A'B'C'$  are graphed on the set of axes below. Precisely describe a sequence of transformations that maps Triangle  $ABC$  onto  $A'B'C'$ .

A rotation of  $90^\circ$  counter clockwise about the origin followed by a reflection over the  $y$ -axis



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UNIT 4

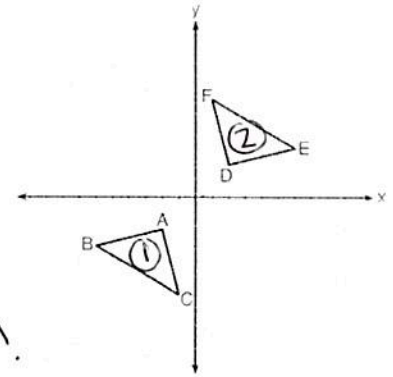
LESSON 8 HOMEWORK

1. Triangle  $ABC$  and triangle  $DEF$  are graphed on the set of axes below.

Which sequence of transformations maps triangle  $ABC$  onto triangle  $DEF$ ?

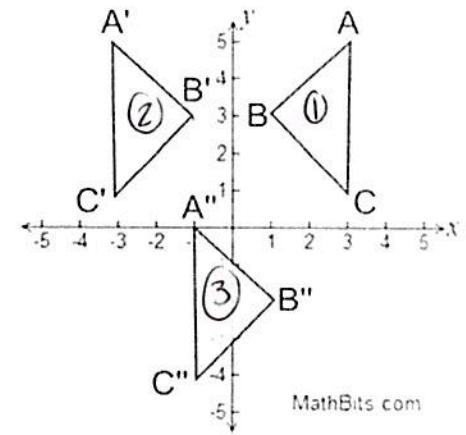
- ① a reflection over the  $x$ -axis followed by a reflection over the  $y$ -axis
- 2) a  $180^\circ$  rotation about the origin followed by a reflection over the line  $y = x$
- 3) a  $90^\circ$  clockwise rotation about the origin followed by a reflection over the  $y$ -axis
- 4) a translation 8 units to the right and 1 unit up followed by a  $90^\circ$  counterclockwise rotation about the origin

2 reflections =  
180° rotation  
orientation  
preserved!



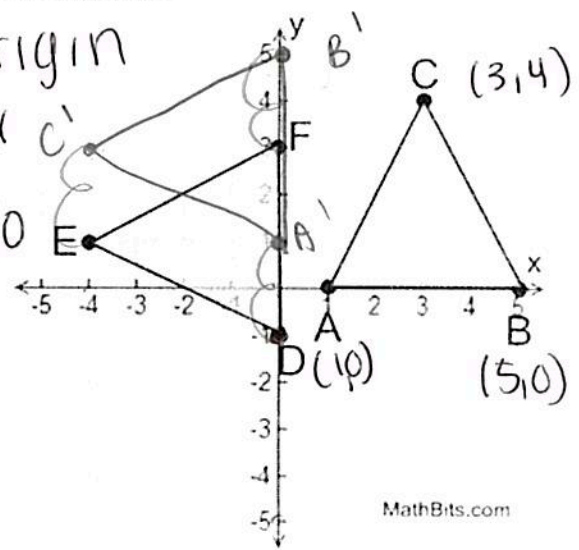
2. Which of the following descriptions pertaining to the graph below is true?

- ~~1)  $\Delta A''B''C''$  is a translation of  $\Delta ABC$ .~~
- ②  $\Delta A''B''C''$  is a translation of  $\Delta A'B'C'$ .
- ~~3)  $\Delta A''B''C''$  is a dilation in the origin of scale factor 2 of  $\Delta ABC$~~
- ~~4)  $\Delta A'B'C'$  is a translation of  $\Delta ABC$~~



3. Describe a sequence of transformations that maps  $\Delta ABC$  to  $\Delta DFE$  as shown at the below.

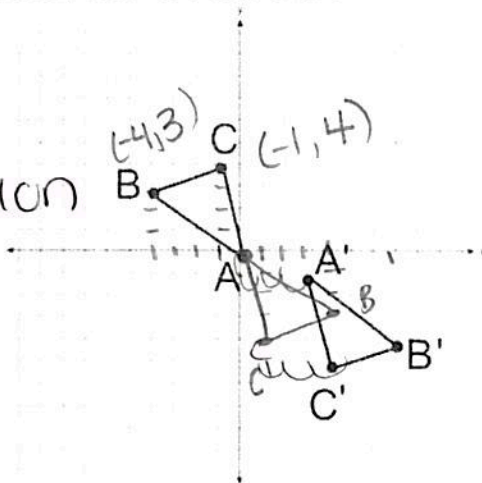
A rotation of  $90^\circ$  about the origin counter clockwise followed by a translation of down two units.



Rule  $(x, y) \rightarrow (-y, x)$

4. Triangle  $ABC$  and its image  $A'B'C'$  are graphed on the set of axes below. Precisely describe a sequence of transformations that maps Triangle  $ABC$  onto  $A'B'C'$ .

A rotation of  $180^\circ$  about the origin followed by a translation of down 1, right 3 units.



$$\text{Rule } (x, y) \rightarrow (-x, -y)$$

5. The graph to the right shows  $\triangle ABC$  and its image,  $\triangle A''B''C''$ .

Describe a sequence of rigid motions which would map  $\triangle ABC$  onto  $\triangle A''B''C''$ .

A reflection over the  $y$ -axis followed by a translation of down 2 units

