Name: Key　　　　　　　　　　Date: ____________

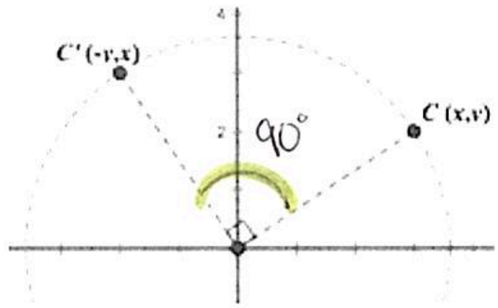
UNIT 2　　　　　　　　　　LESSON 5

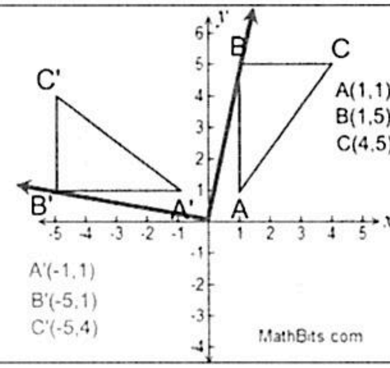
AIM: HOW DO WE EVALUATE ROTATIONS ON THE COORDINATE PLANE?

Rotate 90 °

CCW around origin

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

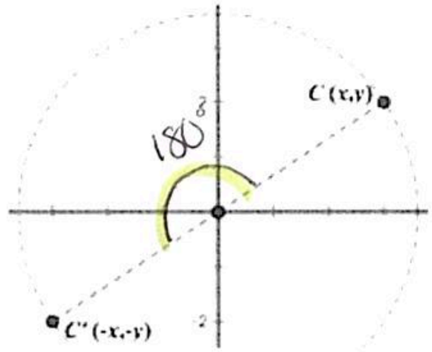


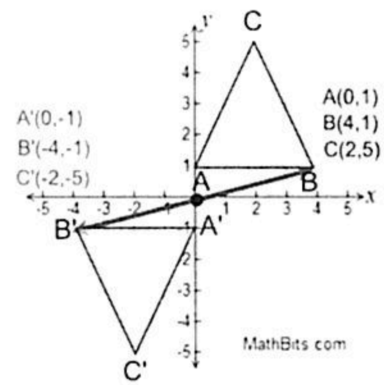


Rotate 180 °

CCW around origin

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

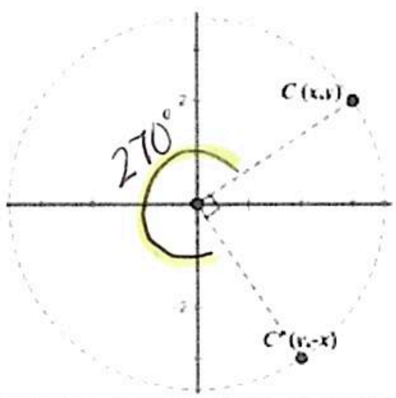


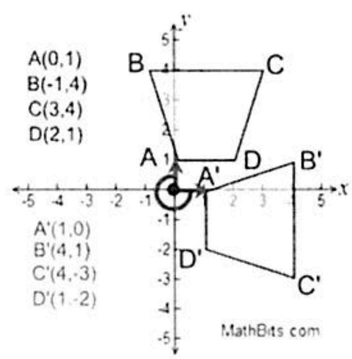


Rotate 270 °

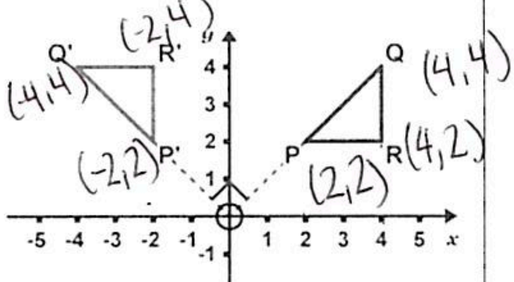
CCW around origin

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



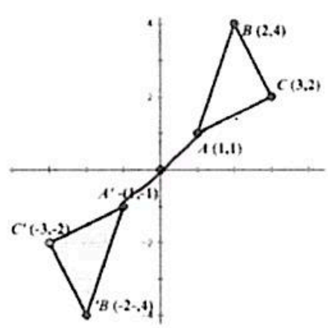


1. Describe the transformation that maps ΔPQR onto $\Delta P'Q'R'$.



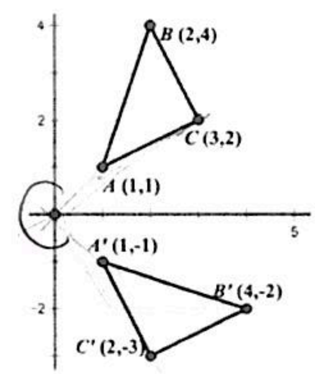
$R_{0,90°}$

2. Describe the transformation that maps ΔABC onto $\Delta A'B'C'$.



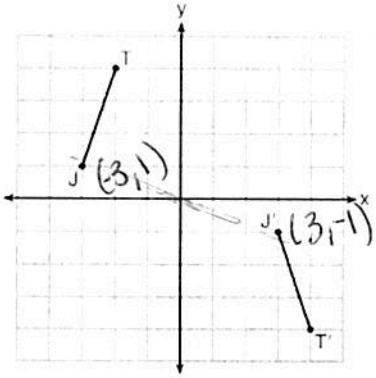
$R_{0,180°}$

3. Describe the transformation that maps ΔABC onto $\Delta A'B'C'$.



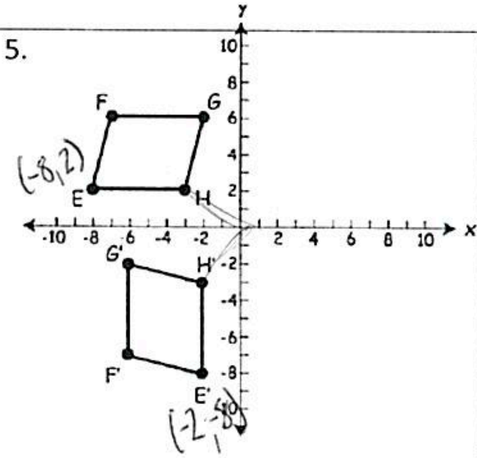
$R_{0,270°}$

4.



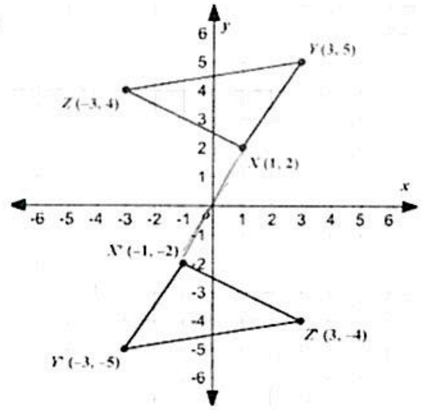
$R_{0,180°}$

5.



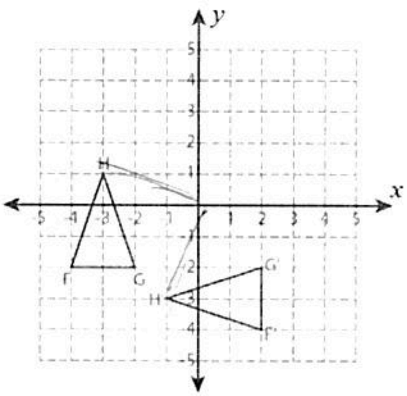
$R_{0,90°}$

6.



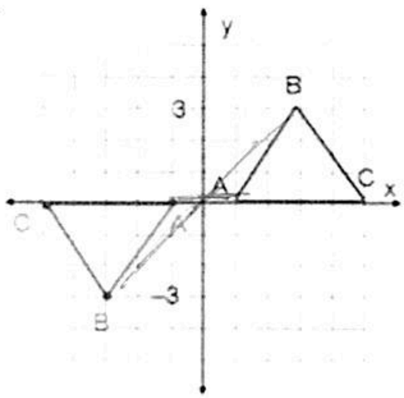
$R_{0,180°}$

7.



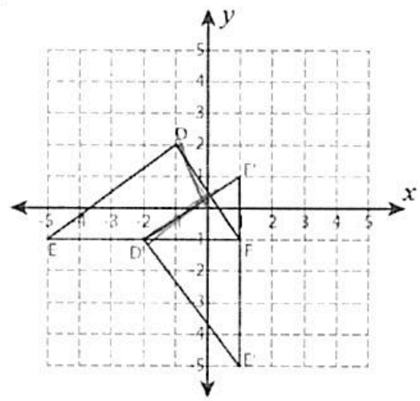
$R_{0,270°}$

8.



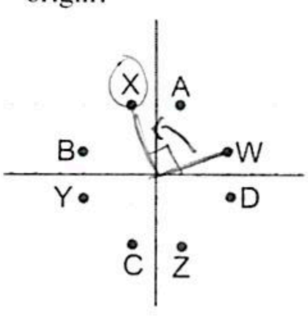
$R_{0,180°}$

9.



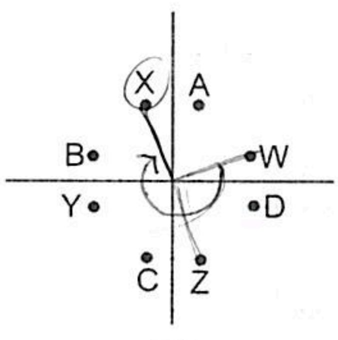
$R_{0,90°}$

10. Which point shown in the graph below is the image of point W after a counterclockwise rotation of 90° about the origin?



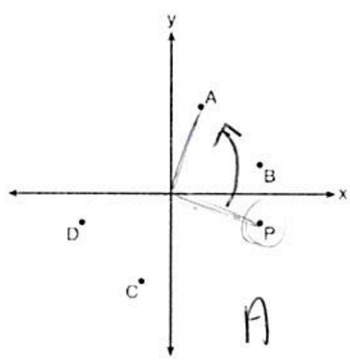
X

11. Which point shown in the graph below is the image of point W after a clockwise rotation of 270° about the origin?



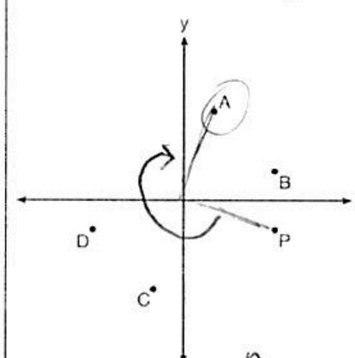
X

12. Which point shown in the graph below is the image of point *P* after a counterclockwise rotation of 90° about the origin?



A

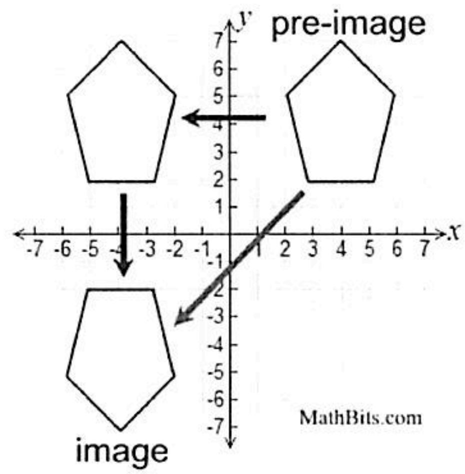
13. Which point shown in the graph below is the image of point *P* after a clockwise rotation of 270° about the origin?



A

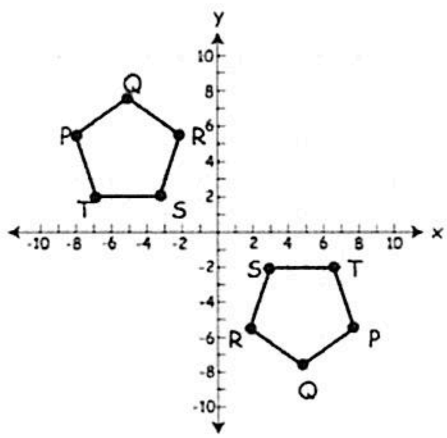
CONCLUSION: If you rotate an image CCW 90°, it is equivalent to a rotation CW 270°

The combination of a line reflection in the y-axis, followed by a line reflection in the x-axis, can be renamed as a single transformation of a rotation of 180° about the origin.



CONCLUSION: Reflecting an image twice has the same result as rotating an image 180°

14. Describe transformation(s) that maps $PQRST$ onto $P'Q'R'S'T'$.

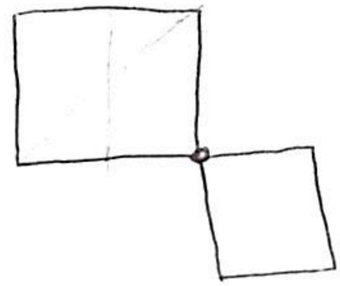


(1) A reflection over the y axis followed by a reflection over the x-axis such that PQRST maps onto P'Q'R'S'T'.

(2) A rotation of 180° about the origin such that PQRST maps onto P'Q'R'S'T'

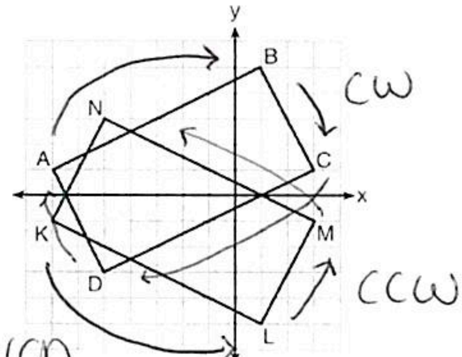
15. Which transformation would *not* carry a square onto itself?

1) a reflection over one of its diagonals
2) a 90° rotation clockwise about its center
3) a 180° rotation about one of its vertices
4) a reflection over the perpendicular bisector of one side



16. On the set of axes below, rectangle *ABCD* can be proven congruent to rectangle *KLMN* using which transformation?

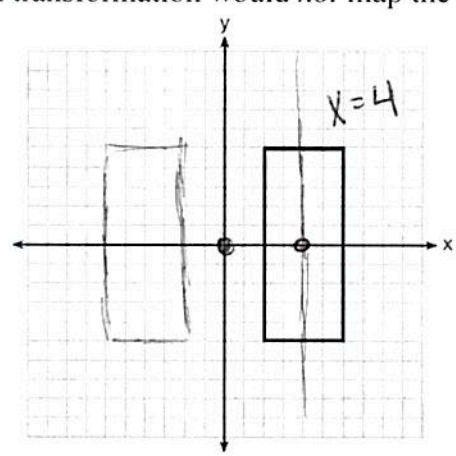
1) rotation
2) translation
3) reflection over the x-axis
4) reflection over the y-axis



orientation changes! → Reflection

17. As shown in the graph below, the quadrilateral is a rectangle. Which transformation would *not* map the rectangle onto itself?

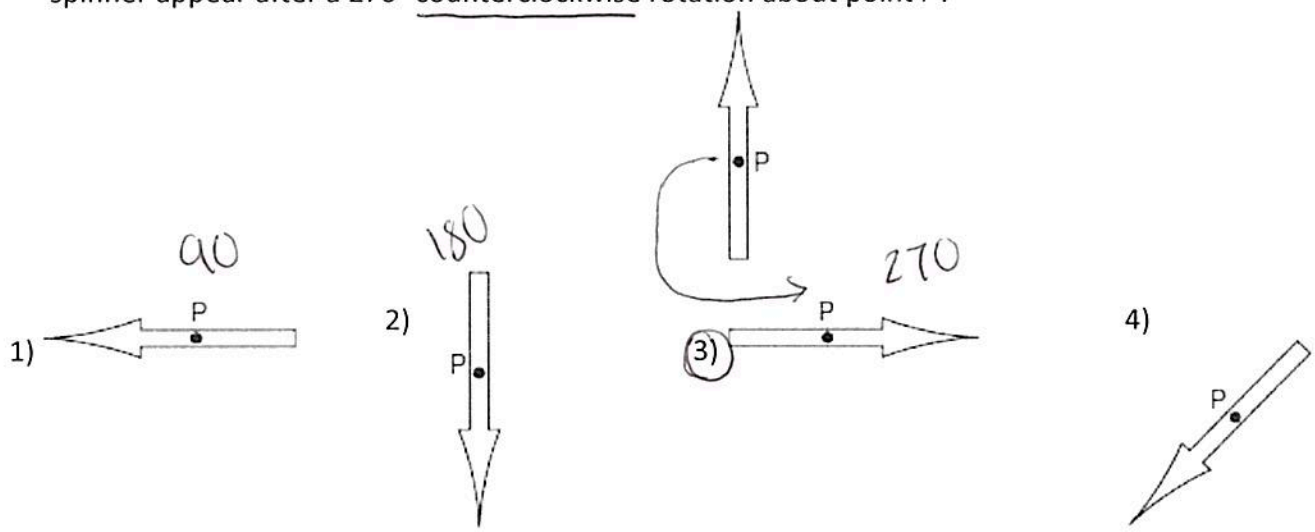
1) a reflection over the x-axis
2) a reflection over the line $x = 4$
3) a rotation of 180° about the origin
4) a rotation of 180° about the point $(4, 0)$



Name: Key   Date: ______________

UNIT 2   **LESSON 5 HOMEWORK**

1) The accompanying diagram shows the starting position of the spinner on a board game. How does this spinner appear after a 270° counterclockwise rotation about point P?



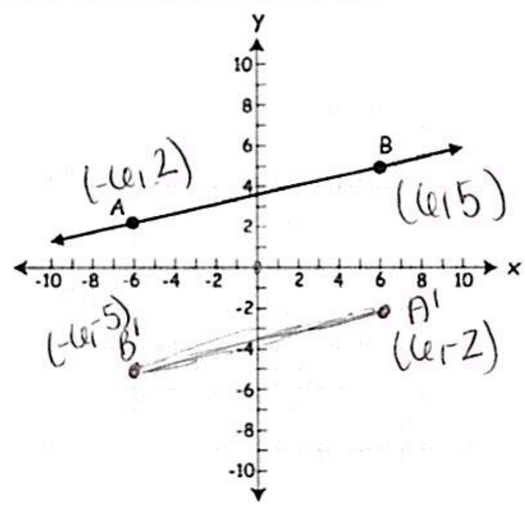
2)
If $\overleftrightarrow{AB}$ was rotated 180° about the origin to form its image $\overleftrightarrow{AB}$, what type of lines would $\overleftrightarrow{AB}$ and $\overleftrightarrow{AB}$ create?

Ⓐ ~~Intersecting Lines~~

Ⓑ Parallel Lines

Ⓒ Perpendicular Lines

Ⓓ Skew Lines



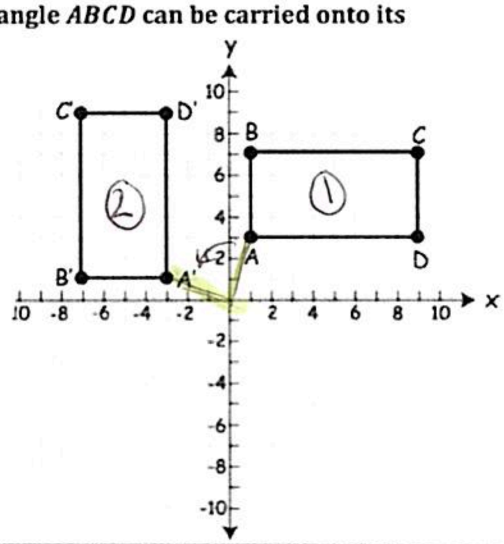
3)
Based on the figure below, describe how rectangle $ABCD$ can be carried onto its image $ABCD$.

Ⓐ Reflection across the x-axis

Ⓑ Reflection across the y-axis

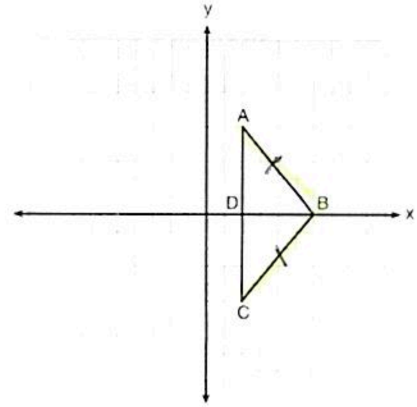
Ⓒ ~~Rotation 90° clockwise about the origin~~

Ⓓ Rotation 90° counterclockwise about the origin



4) As shown in the diagram below, when right triangle *DAB* is reflected over the *x*-axis, its image is triangle *DCB*. Which statement justifies why $\overline{AB} \cong \overline{CB}$?

1) Distance is preserved under reflection.
2) Orientation is preserved under reflection.
3) Points on the line of reflection remain invariant.
4) Right angles remain congruent under reflection.



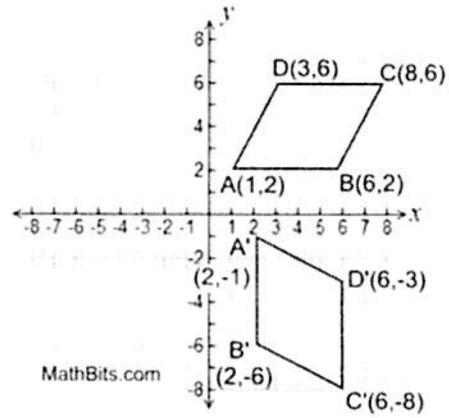
5) Which rotation would map $ABCD$ onto $A'B'C'D'$

(1) $ABCD$ rotated CCW $360°$ around the origin.
(2) $ABCD$ rotated CCW $270°$ around the origin.
(3) $ABCD$ rotated CCW $180°$ around the origin.
(4) $ABCD$ rotated CCW $90°$ around the origin.

$(1,2) \to (2,-1)$

$(x,y) \to (y,-x)$

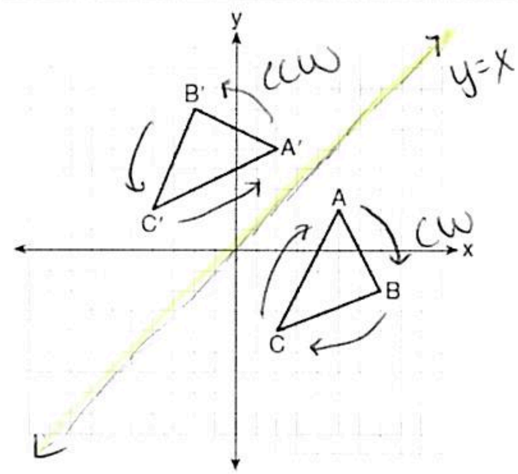
$270°$



6) The graph below shows two congruent triangles, *ABC* and *A'B'C'*.

Which rigid motion would map $\triangle ABC$ onto $\triangle A'B'C'$?

1) a rotation of 90 degrees counterclockwise about the origin
2) a translation of three units to the left and three units up
3) a rotation of 180 degrees about the origin
4) a reflection over the line $y = x$



7) In the diagram of ΔABC below, $\overline{BD}$ is drawn to side $\overline{AC}$. If $m\angle A = 35$, $m\angle ABD = 25$, and $m\angle C = 60$, which type of triangle is ΔBCD?

1) equilateral
2) scalene
3) obtuse
4) right