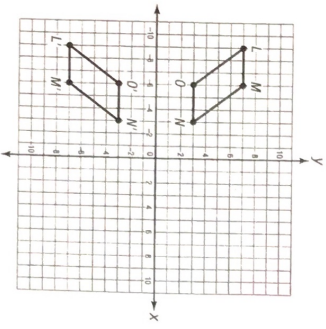


Unit 5 Assessment • Transformations in the Coordinate Plane

1. Which of the following is the definition of a circle?

- A. a figure without corners or sides
- B. a figure with parallel sides of equal length
- C. the resulting figure when a round cone is cut obliquely by a plane
- D. the set of all points that are the same distance from a point called the center**

2. The transformation from parallelogram LMNO to parallelogram L'M'N'O' is shown on the coordinate plane below.



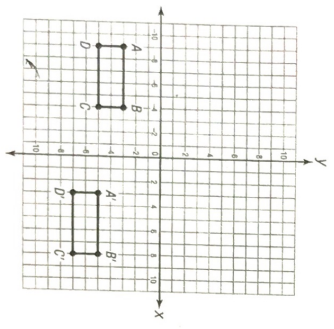
Which best describes the transformation that was performed?

- A. dilation with origin (0, 0)
- B. reflection over the x-axis**
- C. rotation around the origin
- D. translation in the negative y-direction

3. Which of the following best describes a geometric rotation?

- A. a transformation that turns a figure around a point**
 - B. a transformation that slides a figure to a new location
 - C. a transformation that flips a figure across a line
 - D. a transformation that enlarges or reduces the size of a figure by a certain scale factor
- Handwritten notes: reflection, dilation*

4. The transformation from rectangle ABCD to rectangle A'B'C'D' is shown on the coordinate plane below.



Which of the following best describes the translation using function notation?

- A. $T(x, y) \rightarrow (-x, y)$
- B. $T(x, y) \rightarrow (x - 12, y + 2)$
- C. $T(x, y) \rightarrow (x + 12, y - 2)$**
- D. $T(x, y) \rightarrow (-x, -y)$

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5. Which of the following best describes a geometric dilation?

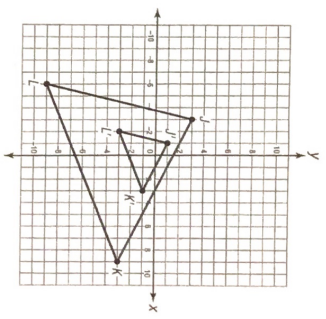
- A. a transformation that turns a figure around a point
- B. a transformation that slides a figure to a new location
- C. a transformation that flips a figure across a line
- D. a transformation that enlarges or reduces the size of a figure by a certain scale factor**

6. Pooray used parking cones to set up a rectangular football field in the park. However, when his friend Brendan arrived at the park, he told Pooray that they should dilate the field by $\frac{1}{2}$. Which best describes the changes that Brendan and Pooray will make to the side lengths and interior angles of the football field?

- A. The interior angles will change, but the side lengths will remain the same.
- B. The interior angles will remain the same, but the side lengths will change.**
- C. Both the side lengths and the interior angles will change.
- D. Neither interior angles nor side lengths will change.

Handwritten note: dilation: side lengths change and angles always stay the same

7. The transformation from triangle JKL to triangle J'K'L' is shown on the coordinate plane below.

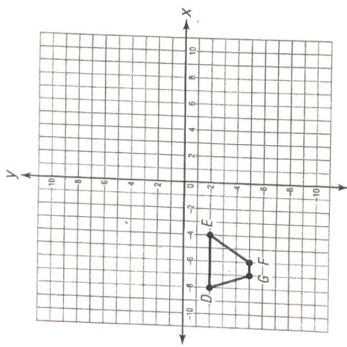


Which of the following best describes the dilation using function notation?

- A. $D_{\frac{1}{2}}(x, y) \rightarrow (\frac{1}{2}x, \frac{1}{2}y)$** ← got smaller
 - B. $D_3(x, y) \rightarrow (3x, 3y)$
 - C. $D(x, y) \rightarrow (x + 3, y + 3)$
 - D. $D(x, y) \rightarrow (x - 2, y + 2)$
- Handwritten note: dilation multiply by*

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Trapezoid $DEFG$ is graphed on the coordinate plane below.



Which series of transformations will move trapezoid $DEFG$ onto itself?

- A. reflection over the y -axis and then rotation 180° clockwise around the origin
- B. reflection over the x -axis and then rotation 270° counterclockwise around the origin
- C. reflection over the y -axis, reflection over the x -axis, and then rotation 180° clockwise around the origin
- D. reflection over the x -axis, reflection over the y -axis, and then rotation 90° counterclockwise around the origin

~~D~~ $(-8, -2)$ ~~A~~ 180° clock ref. y -axis $(+8, -2) \rightarrow (-8, 2)$ ref. x

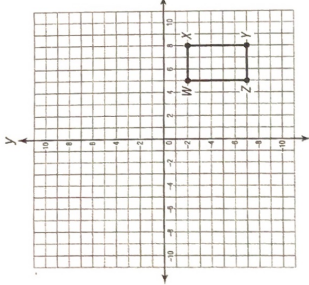
~~B~~ ref. x 270 count $(x, y) \rightarrow (y, -x)$
 $(-8, 2) \rightarrow (2, 8)$ ref 270° count

C ref $y \rightarrow$ ref. $x \rightarrow 180^\circ$ clock
 $(+8, 2) \rightarrow (8, 2) \rightarrow (-8, 2)$

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9. Rectangle $WXYZ$ is graphed on the coordinate plane below.

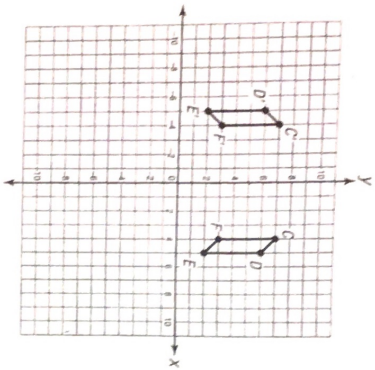


W $(5, 2)$
 $(2, 5)$
 270 clock $(x, y) \rightarrow (-y, x)$

Which rectangle graphed below represents the image of rectangle $WXYZ$ after a rotation 270° clockwise around the origin?

- A.
- B.
- C.
- D.

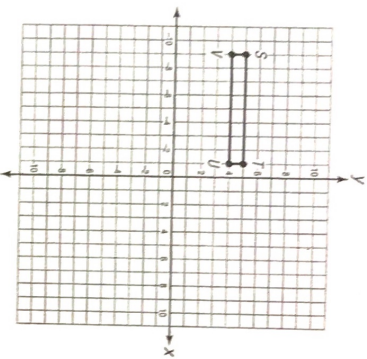
10. The transformation from parallelogram $CDEF$ to parallelogram $C'D'E'F'$ is shown on the coordinate plane below.



Which of the following best describes the reflection using function notation?

- A. $F(x, y) \rightarrow (x, -y)$
- B. $F(x, y) \rightarrow (-x, y)$**
- C. $F(x, y) \rightarrow (x, y)$
- D. $F(x, y) \rightarrow (-x, -y)$

11. Rectangle $STUV$ is graphed on the coordinate plane below.



Which series of transformations will move rectangle $STUV$ onto itself?

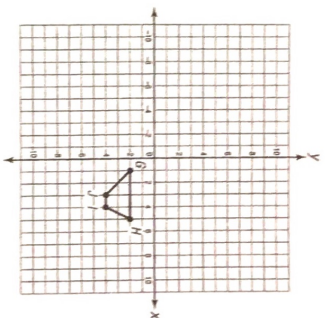
- A. reflection over the y -axis, rotation around the origin 180° clockwise, and then reflection over the y -axis
- B. reflection over the x -axis, reflection over the y -axis, and then rotation around the origin 270° counterclockwise
- C. reflection over the y -axis, reflection over the x -axis, and then rotation around the origin 180° counterclockwise**
- D. reflection over the x -axis, reflection over the y -axis, and then rotation around the origin 90° clockwise

Handwritten notes for question 11:

- A** $(9, 7)$ X
- $(-9, -7)$ X
- $(9, -7)$ X
- B** $(-9, -7)$ X
- $(9, -7)$ X
- $(-7, -9)$ X
- $(9, 7)$ X
- $(9, -7)$ X
- $(-9, 7)$ X
- C** $(9, 7)$ ✓
- $(-9, 7)$ ✓

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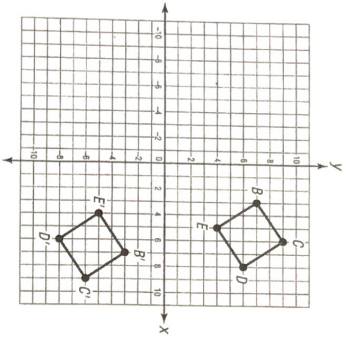
12. Trapezoid $GHIJ$ is graphed on the coordinate plane below.



Which graph represents the image of trapezoid $GHIJ$ after the transformation $T(x, y) \rightarrow (x + 2, y + 2)$?

- A.
- B.
- C.**
- D.

13. Square $BCDE$ and its image after rotation, square $B'C'D'E'$, are graphed on the coordinate plane below.



Which of the following best describes the rotation using function notation?

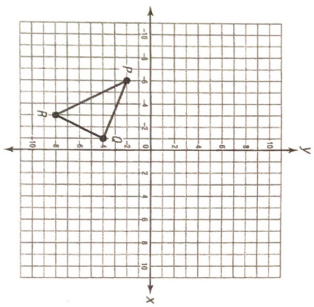
- A. $R_{90}(x, y) \rightarrow (-y, x)$
- B. $R_{180}(x, y) \rightarrow (-x, -y)$
- C. $R_{270}(x, y) \rightarrow (y, -x)$
- D. $R_{360}(x, y) \rightarrow (x, y)$

$D(8, 6)$

$D'(6, -8)$

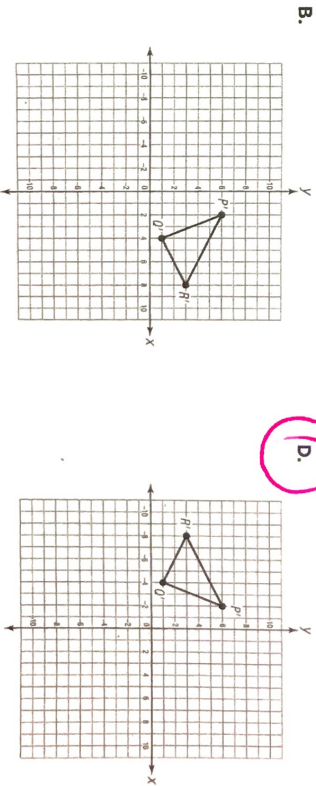
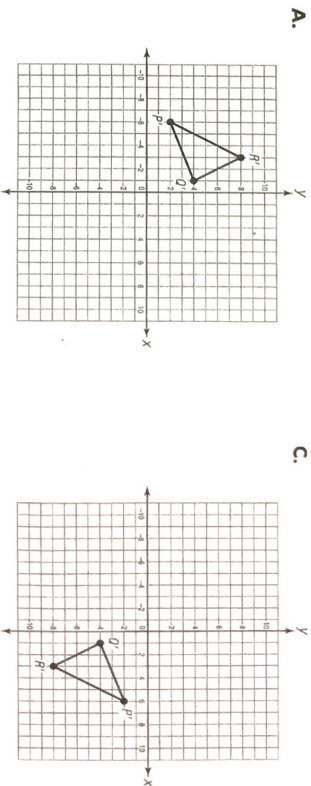
So flipped & x became opposite = clockwise

14. Triangle PQR is graphed on the coordinate plane below.



$R(-3, -8)$
 $R'(-8, 3)$

Which graph represents the image of $\triangle PQR$ after the transformation $R_{270}(x, y) \rightarrow (y, -x)$?



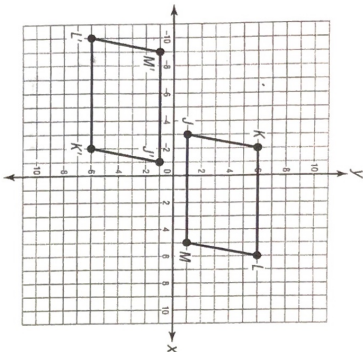
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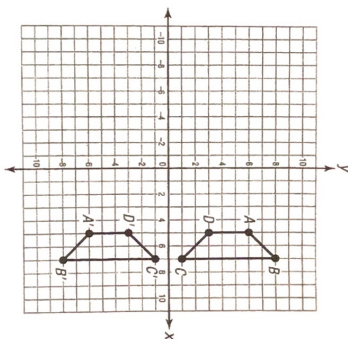
15. Parallelogram $JKLM$ and its image after a series of transformations, parallelogram $J'K'L'M'$, are graphed on the coordinate plane below.



- Which series of transformations mapped parallelogram $JKLM$ onto $J'K'L'M'$?
- A. reflection over the y -axis, translation 4 units left, and then reflection over the x -axis
 - B. rotation around the origin 180° clockwise, reflection over the y -axis, and then translation 2 units left
 - C. translation 4 units left, reflection over the x -axis, and then reflection over the y -axis
 - D. rotation around the origin 90° clockwise, reflection over the x -axis, and then rotation around the origin 270° counterclockwise

$M(5, 1)$ $(-5, 1)$
 \downarrow $(-9, 1)$
 $(-9, -1)$ $(-9, -1)$

16. The graph below shows trapezoid $ABCD$ and its reflection across the x -axis, $A'B'C'D'$.



How would you represent the reflection performed using function notation? Show all your work.

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

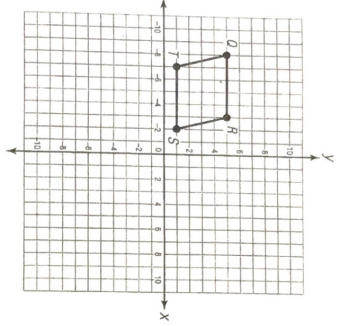
17. Use the concept of "geometric translation" to give a definition of parallel lines.

any figures that are translated will be parallel to each other

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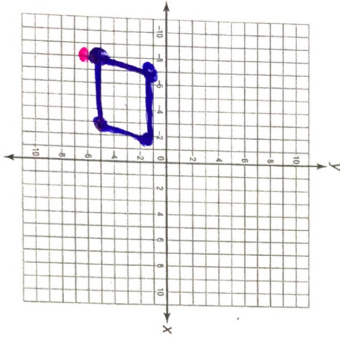
18. The parallelogram QRST is graphed on the coordinate plane below.



Use a three-step series consisting of a combination only of rotations and reflections to transform parallelogram QRST onto itself, such that $F(x, y) \rightarrow (x, y)$. Use at least one rotation and at least one reflection.

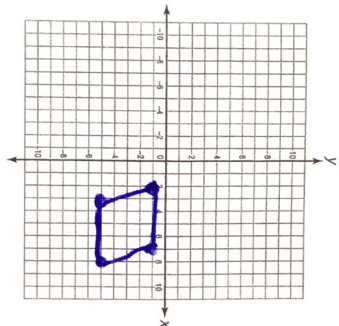
- A. Describe the first rotation or reflection that could be used and graph the result.

ref. over the y-axis



- B. Describe the second rotation or reflection that could be used and graph the result.

ref. over the x-axis



- C. Describe the third rotation or reflection that could be used.

180° rotation

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