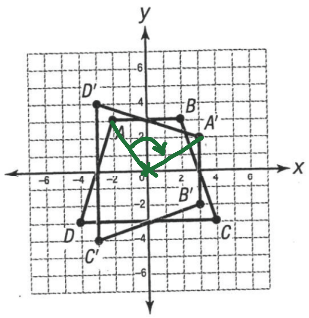
Practice

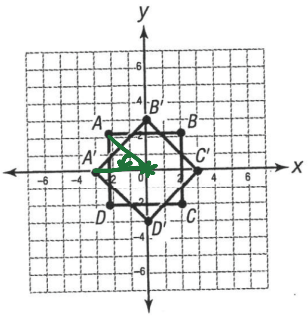
Identify the number of degrees (45°, 90°, 180°, or 270°) by which each quadrilateral *ABCD* has been rotated about the origin to form its image.

1.



−90° (or 90° clockwise)

2.

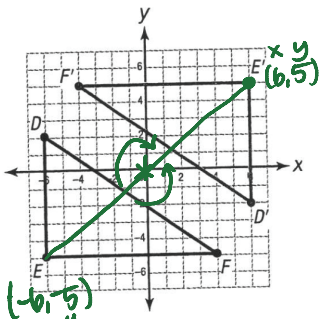


45° (or counterclockwise 45°)

REMEMBER A −90° rotation is equal to a 270° rotation.

Describe how △*DEF* was rotated to form △*D′E′F′* both in words and in function notation.

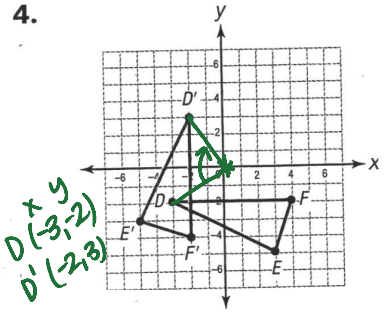
3.



Words: △DEF was rotated 180° about (0,0)

Function: $R_{180°}(x,y) = (-x,-y)$

4.



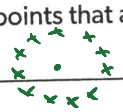
Words: △DEF was rotated −90° about (0,0) or 270° about (0,0)

Function: $R_{-90°}(x,y) = (y,-x)$ OR $R_{270°}(x,y) = (y,-x)$

Write *true* or *false* for each statement. If false, rewrite the statement to make it true.

5. A circle is the set of all points that are equidistant from a point called the center.

True ☺



6. A quarter-turn in the counterclockwise direction is equivalent to a −90° rotation.

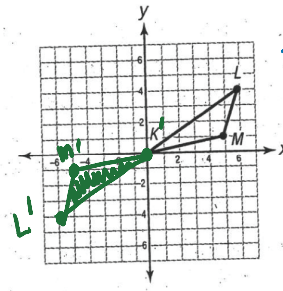
False ☹ A $\frac{1}{4}$ turn in the ccw direction is equivalent to a −270° rotation.

7. Corresponding sides of a preimage and an image after a 270° rotation are ~~parallel.~~

False ☹ *Look at ?#4... $\overline{DF}$ is not ll to $\overline{D'F'}$... How are they related?

Use the given function to rotate $\triangle KLM$ to form $\triangle K'L'M'$. Identify the coordinates of the vertices of the image. Then identify the degree measure of the rotation.

8. $R_\theta(x, y) = (-x, -y)$

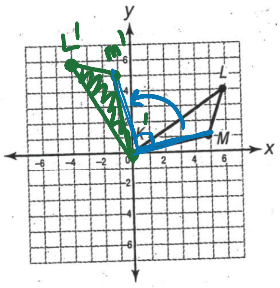


K(0,0) K'(0,0)
L(6,4) L'(-6,-4)
M(5,1) M'(-5,-1)

K'(0 , 0) L'(-6 , -4) M'(-5 , -1)

$\theta = 180°$ or $\theta = -180°$

9. $R_\theta(x, y) = (-y, x)$

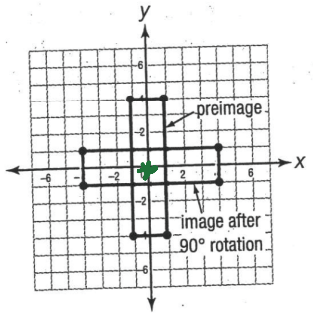


K'(0 , 0) L'(-4 , 6) M'(-1 , 5)

$\theta = 90°$ or $\theta = -270°$

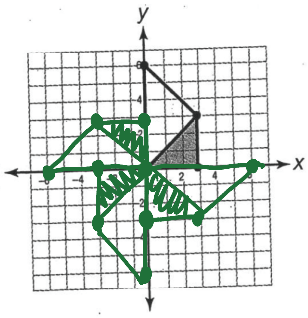
Solve.

10. **EXPLAIN** Sal drew a rectangle on a coordinate plane. He then rotated it 90° as shown below. Is there another way he could have rotated the rectangle that would have yielded the same image? Explain your reasoning.



He could have rotated the image -90°, 270°, -270°. ← Why do you think these work too?

11. **DRAW** An artist drew a blue and white trapezoid on a computer. She wants to copy and rotate this image three times about the origin to create a figure that looks like a pinwheel. Describe three rotations she could use. Draw the pinwheel that would result from those three rotations.



I rotated the preimage 3 times:
① 90° ② 180° ③ -90° or 270°