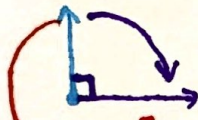


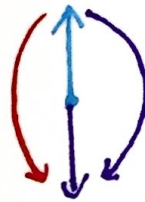
Pre-Image: the object we start with or the "before" object
A

Image: the object after we do something to it.
A' A prime

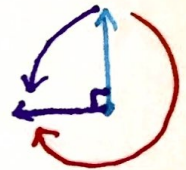
Rotations:
TURN



90° CW
270° CCW



180° CW or CCW

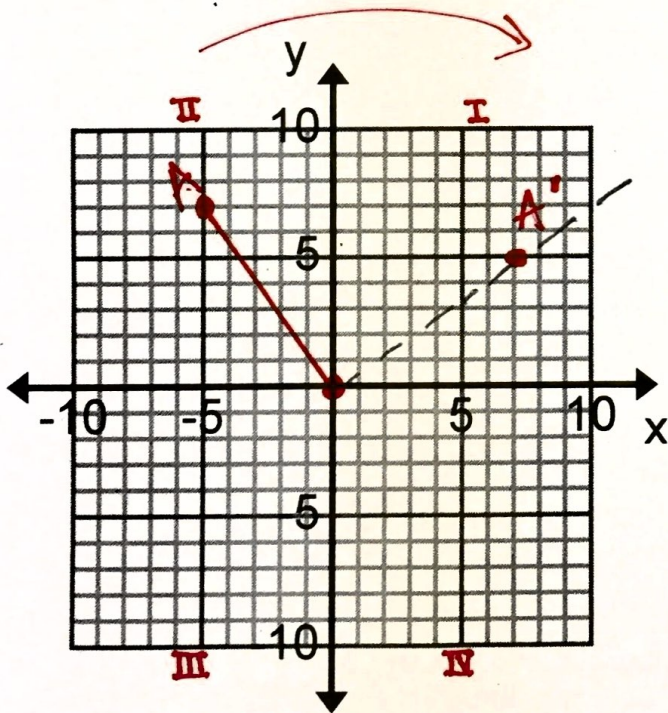


270° CW
90° CCW

Directions:

90° ∠ have opp reciprocal slopes

Example 1 Rotate the point A(-5,7) 90° clockwise around the origin. What are the co-ordinates of A'?



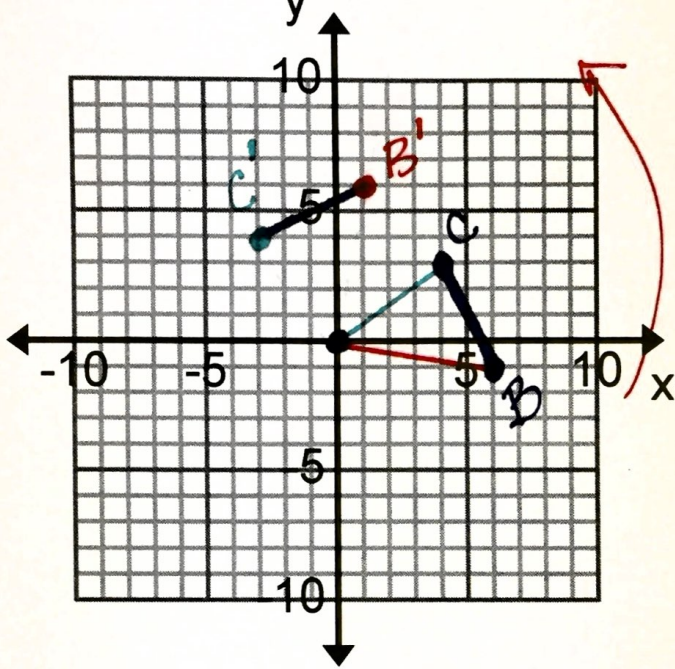
① Estimated the rotation with the card

② Get the SLOPE from the center → point $\frac{\text{Rise}}{\text{Run}}$

To A = $\frac{7}{-5}$

To A' = $\frac{5}{7}$

Example 2 Rotate line segment \overline{BC} 90° counterclockwise around the origin. $B(6, -1)$, $C(4, 3)$. What are the co-ordinates of $B'C'$?



$$\text{To } B = \frac{-1}{6}$$

$$\text{To } B' = \frac{6}{1}$$

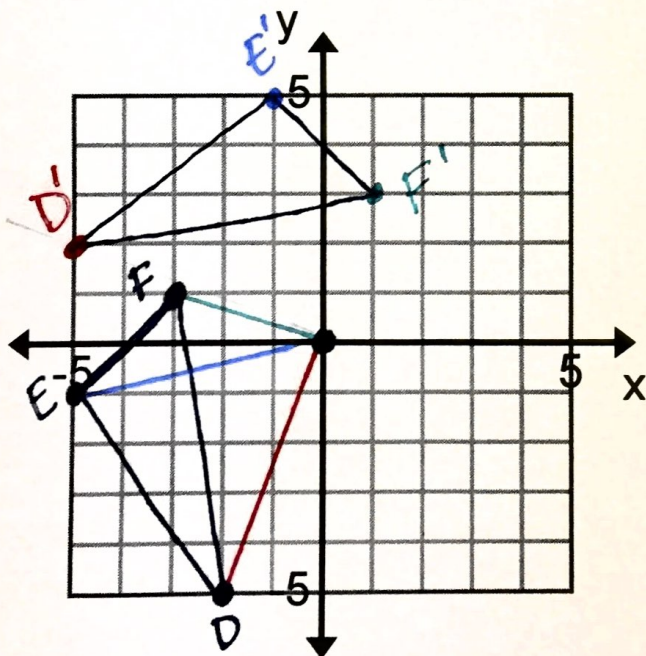
$$\text{To } C = \frac{3}{4}$$

$$\text{To } C' = \frac{4}{-3}$$

$$B'(1, 6)$$

$$C'(-3, 4)$$

Example 3 Rotate triangle DEF 90° clockwise around the origin and list the co-ordinates of the new vertices $D(-2, -5)$, $E(-5, -1)$, $F(-3, 1)$



$$\text{To } D = \frac{-5}{-2}$$

$$\text{To } D' = \frac{2}{-5}$$

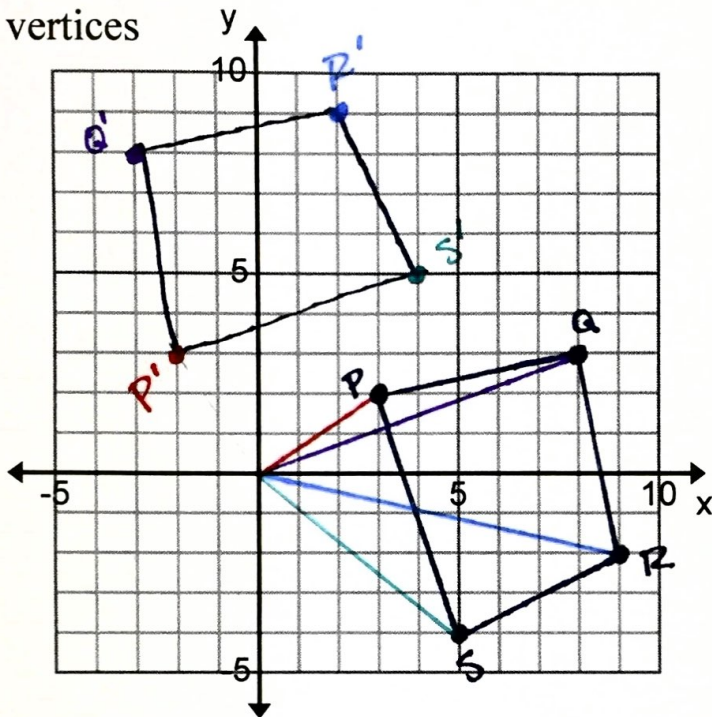
$$\text{To } E = \frac{-1}{-5}$$

$$\text{To } E' = \frac{5}{-1}$$

$$\text{To } F = \frac{1}{-3}$$

$$\text{To } F' = \frac{3}{1}$$

Example 4 Rotate Quadrilateral $PQRS$ 90° counterclockwise around the origin
 $P(3,2)$, $Q(8,3)$, $R(9,-2)$, $S(5,-4)$ State the coordinates of the new vertices



$$T_{OP} = \frac{2}{3}$$

$$T_{OP'} = -\frac{3}{2}$$

$$T_{OQ} = \frac{3}{8}$$

$$T_{OQ'} = -\frac{8}{3}$$

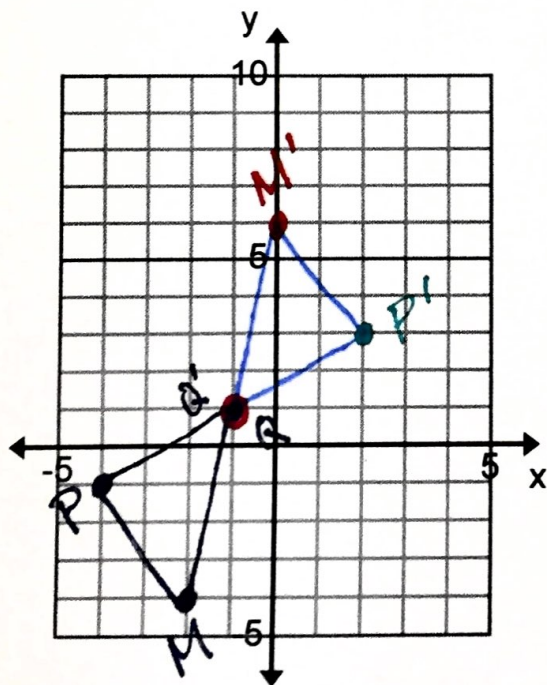
$$T_{OR} = -\frac{2}{9}$$

$$T_{OR'} = \frac{9}{2}$$

$$T_{OS} = -\frac{4}{5}$$

$$T_{OS'} = \frac{5}{4}$$

Example 5 Rotate triangle MPQ 180° clockwise around point Q and list the co-ordinates of the new vertices $M(-2,-4)$, $P(-4,-1)$, $Q(-1,1)$



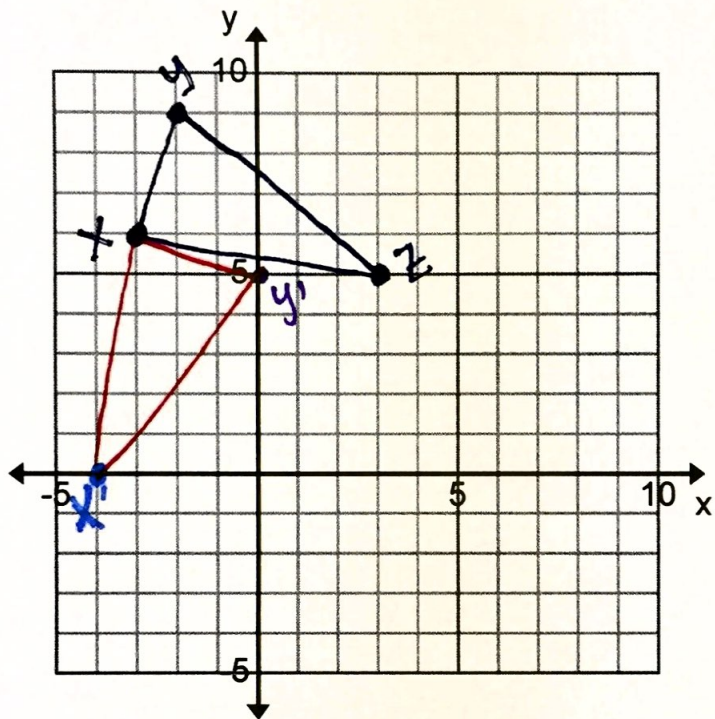
$$T_{QM} = \frac{-5}{-1}$$

$$T_{QM'} = \frac{5}{1}$$

$$T_{QP} = \frac{-2}{-3}$$

$$T_{QP'} = \frac{2}{3}$$

Example 6 Rotate triangle XYZ 90° clockwise around point X and list the coordinates of the new vertices $X(-3,6)$, $Y(-2,9)$, $Z(3,5)$



$$T_0 Z = \frac{-1}{6}$$

$$T_0 Z' = \frac{-6}{-1}$$

$$T_0 Y = \frac{3}{1}$$

$$T_0 Y' = \frac{-1}{3}$$