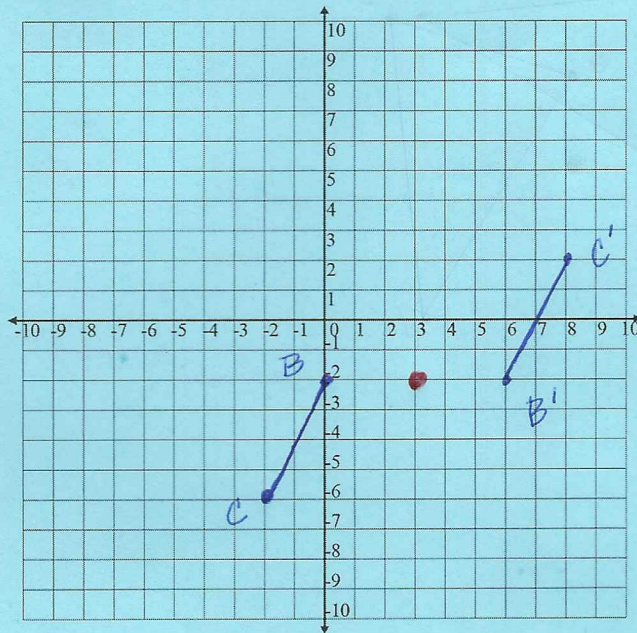


ROTATIONS NOT CENTERED ABOUT THE ORIGIN

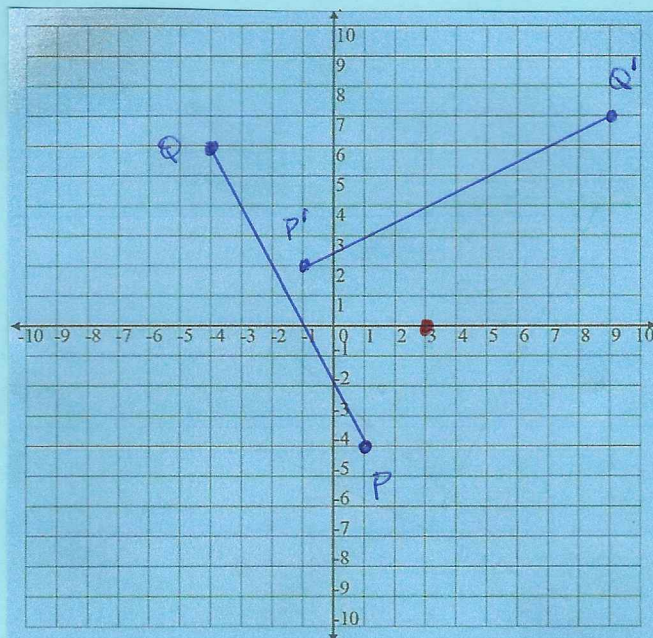
1. Rotate the segment with endpoints B(0, -2) and C(-2, -6) 180° about the point (3, -2).



- 1 Translate rotation point to origin $(x, y) \rightarrow (x-3, y+2)$
- 2 Rotate 180° $(x, y) \rightarrow (-x, -y)$
- 3 Translate rotation point back. $(x, y) \rightarrow (x+3, y-2)$

<u>B</u>	<u>C</u>
(0, -2)	(-2, -6)
1 (-3, 0)	(-5, -4)
2 (3, 0)	(5, 4)
3 (6, -2)	(8, 2)

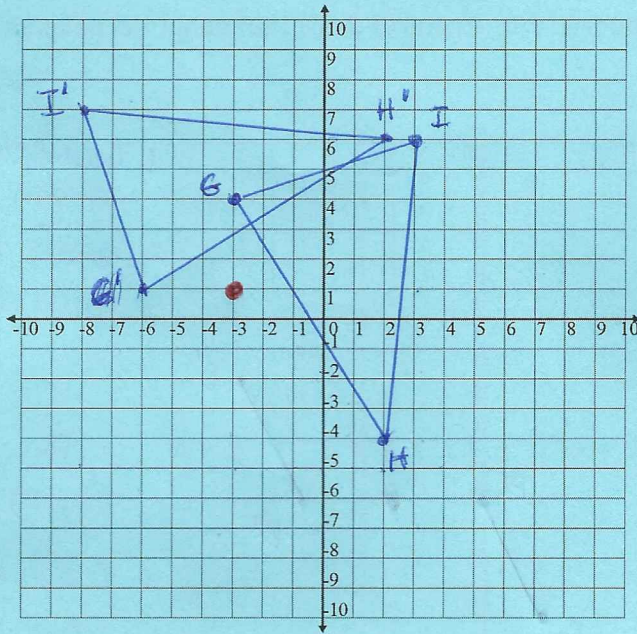
2. Rotate the segment with endpoints at P(1, -4) and Q(-4, 6) 270° counter clockwise about the point (3, 0).



- 1 Translate rotation point to origin $(x, y) \rightarrow (x-3, y)$
- 2 Rotate 270° ccw $(x, y) \rightarrow (y, -x)$
3. Translate back $(x, y) \rightarrow (x+3, y)$

<u>P</u>	<u>Q</u>
(1, -4)	(-4, 6)
1. (-2, -4)	(-7, 6)
2. (+4, 2)	(6, 7)
3. (-1, 2)	(9, 7)

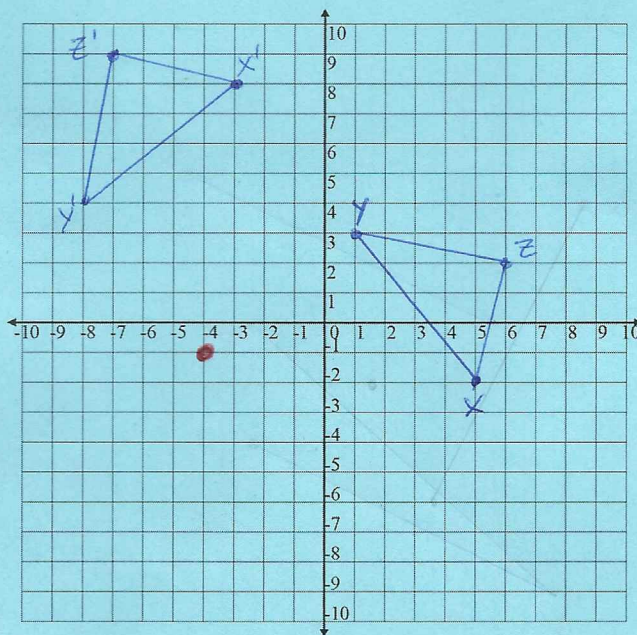
3. Rotate $\triangle GHI$ with $G(-3, 4)$, $H(2, -4)$ and $I(3, 6)$ 270° clockwise about the point $(-3, 1)$.



Translate \rightarrow origin
 $(x, y) \rightarrow (x+3, y-1)$
 Rotate 270° clockwise $(x, y) \rightarrow (-y, x)$
 Translate back $(x, y) \rightarrow (x-3, y+1)$

	<u>G</u>	<u>H</u>	<u>I</u>
	$(-3, 4)$	$(2, -4)$	$(3, 6)$
1.	$(0, 3)$	$(5, -5)$	$(6, 5)$
2.	$(-3, 0)$	$(5, 5)$	$(-5, 6)$
3.	$(-6, 1)$	$(2, 6)$	$(-8, 7)$

4. Rotate $\triangle XYZ$ with $X(5, -2)$, $Y(1, 3)$ and $Z(6, 2)$ 90° counter clockwise about the point $(-4, -1)$.



Translate \rightarrow origin
 $(x, y) \rightarrow (x+4, y+1)$
 Rotate 90° counter $(x, y) \rightarrow (-y, x)$
 Translate back $(x, y) \rightarrow (x-4, y-1)$

	<u>X</u>	<u>Y</u>	<u>Z</u>
	$(5, -2)$	$(1, 3)$	$(6, 2)$
1.	$(9, -1)$	$(5, 4)$	$(10, 3)$
2.	$(1, 9)$	$(-4, 5)$	$(-3, 10)$
3.	$(-3, 8)$	$(-8, 4)$	$(-7, 9)$