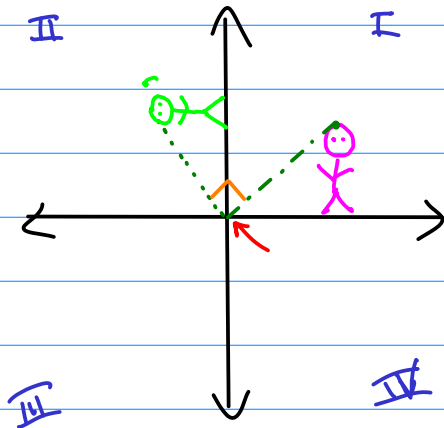
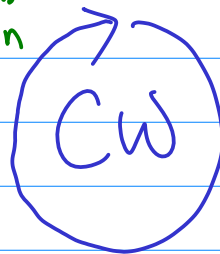


Rotation

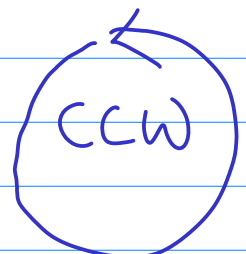
* rotation: turn pts/figure around a center of rotation by a certain # of degrees CW/CCW



90° CCW
rot'n about the
origin



vs



clockwise

counterclockwise

Rules for Rotation (about the origin)

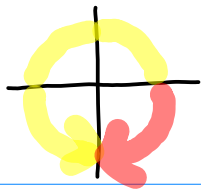
# degrees, direction	rule
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→ 90° CCW	$(x, y) \rightarrow (-y, x)$
→ 90° CW	$(x, y) \rightarrow (y, -x)$
↶ 180° CCW	$(x, y) \rightarrow (-x, -y)$
↷ 180° CW	$(x, y) \rightarrow (-x, -y)$
↶ 270° CCW	$(x, y) \rightarrow (y, -x)$
↷ 270° CW	$(x, y) \rightarrow (-y, x)$

$$A(2, 4) \xrightarrow[90^\circ \text{CCW}]{\text{rot'n}} A'(-4, 2)$$

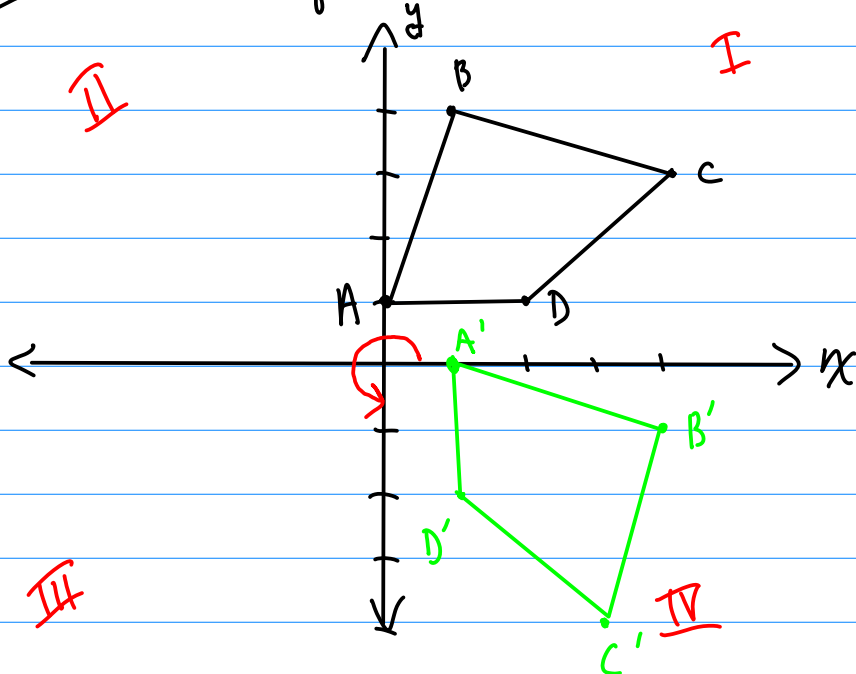
$$A(2, 4) \xrightarrow[90^\circ \text{CW}]{\text{rot'n}} A'(4, -2)$$

$$A(2, 4) \xrightarrow[180^\circ \text{CCW}]{\text{rot'n}} A'(-2, -4)$$



$$(x, y) \xrightarrow[270^\circ \text{CCW}]{\text{rot'n}} (y, -x)$$

Ex: Rotate quad. ABCD 270° CCW about the origin.



$$A(0, 1) \rightarrow A'(1, 0)$$

$$B(1, 4) \rightarrow B'(4, -1)$$

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

$$D(2, 1) \rightarrow D'(1, -2)$$