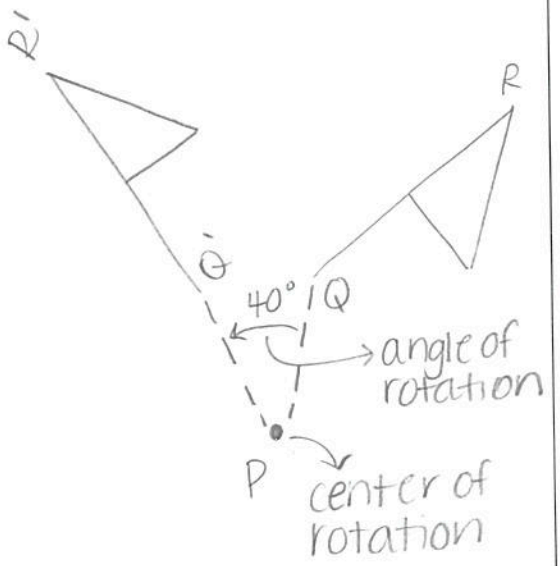
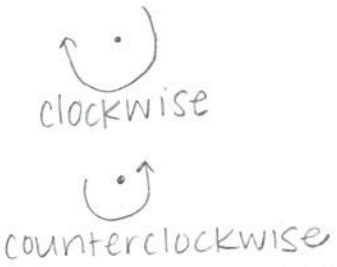
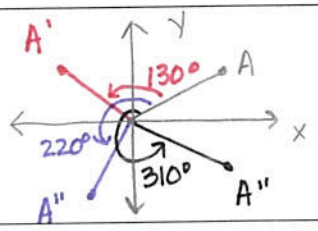
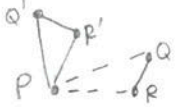
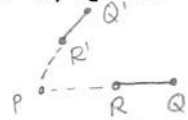
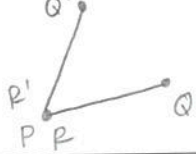
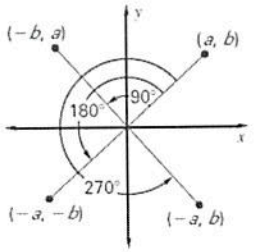
Section Summary: 9.4 Perform Rotations

Term	Definition	Example
rotation	A rotation is a transformation in which a figure is turned about a fixed point.	
center of rotation	The center of rotation is the fixed point about which a figure is rotated.	
angle of rotation	**The angle of rotation is the angle formed by the rays drawn from the center of rotation to a point on a figure and its respective point on the image.**	
direction of rotation	**A direction of rotation can be clockwise or counterclockwise.** **Note: all rotations in this chapter are counterclockwise.**	
rotations about the origin	**Rotations about the origin are rotations which have the origin as their center of rotation.**	
Theorem 9.3 Rotation Theorem	**A rotation is an isometry.** **Consider a segment QR rotated about point P to produce segment Q'P'.** **A rotation _____ the length of a segment and the measure of an angle**	**Case 1: R, Q, P are noncollinear**  **Case 2: R, Q and P are collinear**  **Case 3: P and R are the same point.** 

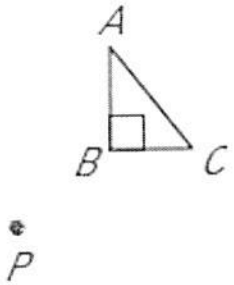
Coordinate Rules for Rotations about the Origin

When a point (a,b) is rotated counterclockwise about the origin, the following are true:

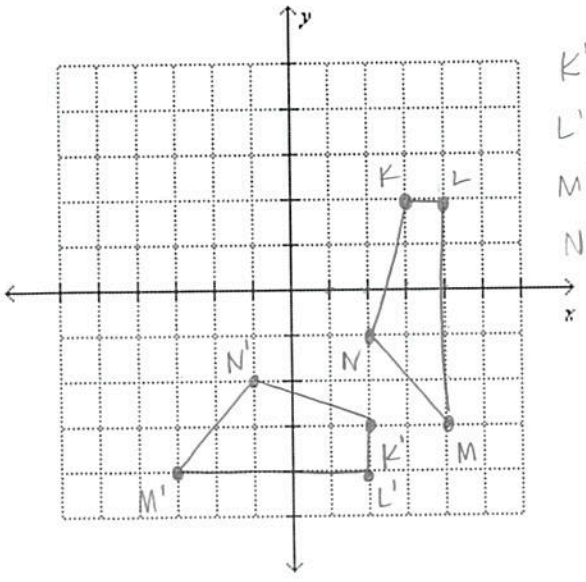
1. **For a rotation of 90°, (a,b) → (-b,a).**
2. **For a rotation of 180°, (a,b) → (-a,-b).**
3. **For a rotation of 270°, (a,b) → (b,-a).**



1. Draw a 150° rotation of ΔABC about P.
(Hint: Use example 1 from pg.598)
you need a protractor + ruler!

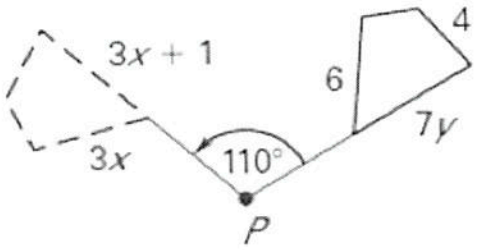


2. Graph quadrilateral KLMN with vertices K(3,2), L(4,2), M(4,-3), N(2,-1). Then rotate the quadrilateral 270° counterclockwise about the origin.
(Hint: use coordinate rules mentioned above to get new coordinates)



K' (2, -3)
L' (2, -4)
M' (-3, -4)
N' (-1, -2)

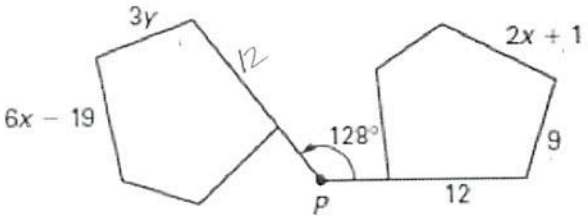
3. The quadrilateral is rotated about P. Find the value of y.



$3x = 6$
$x = 2$

$7y = 3x + 1$
$7y = 3(2) + 1$
$7y = 6 + 1$
$7y = 7$
$y = 1$

4. The pentagon is rotated about P. Find the value of x.



$2x + 1 = 6x - 19$
$20 = 4x$
$5 = x$