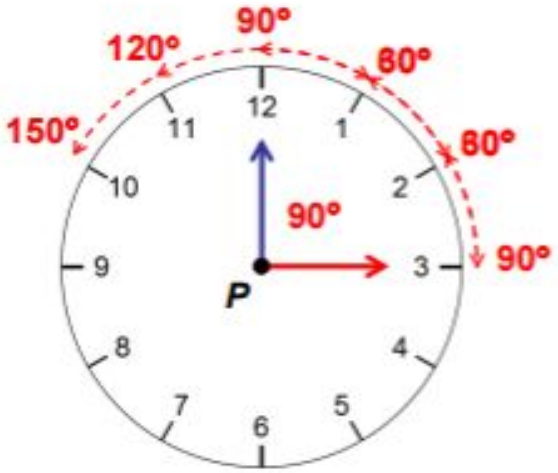
Rotations

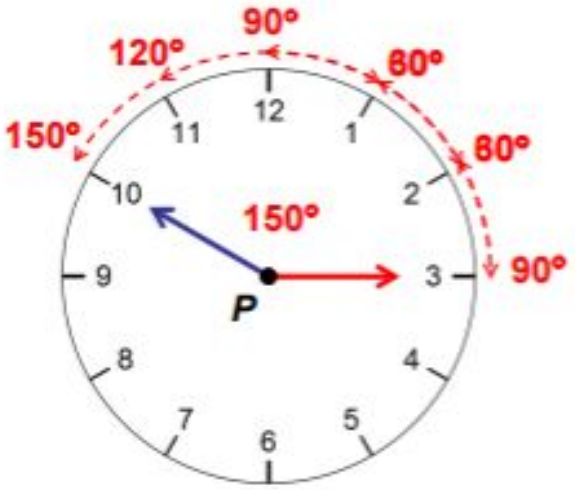
If you are familiar with an analog clock, then you are familiar with the concept of geometric rotations.



The hour hand is pointing to 12 o'clock.

If the end remains fixed at point P, what time will it be after a 90° clockwise rotation?

If it starts at 3 o'clock and rotates 150° counterclockwise around point P, what time will it be?

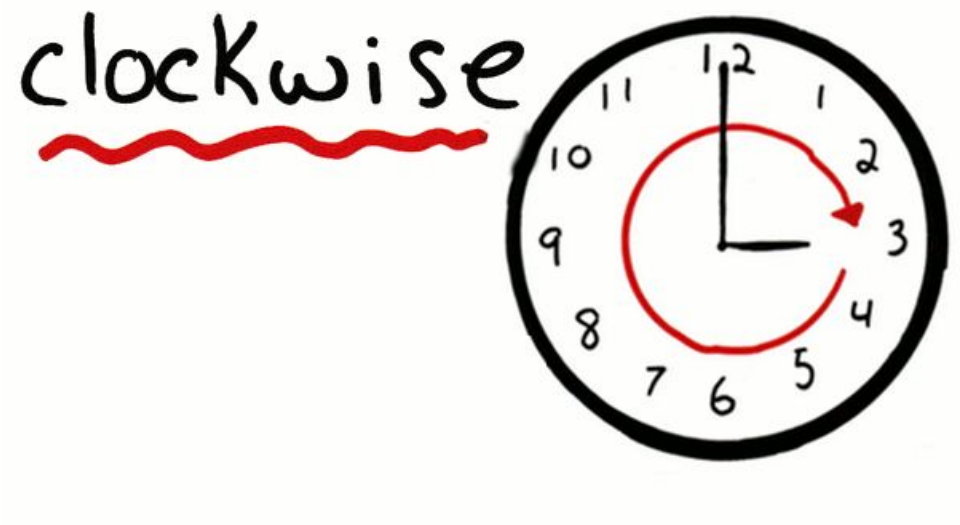


What is a Rotation?

A rotation is a geometric transformation that rotates a shape clockwise or counterclockwise around a given point and a specific angle.

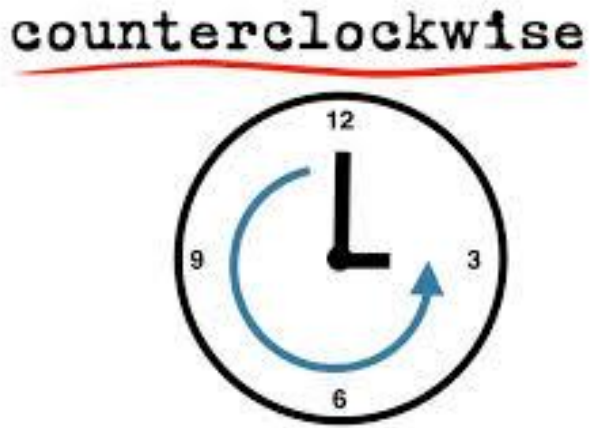
Clockwise VS. Counterclockwise

Clockwise (CW) we are moving in the same direction that the clock moves!



Clockwise VS. Counterclockwise

Counter clockwise (CCW) we are moving in the opposite direction that the clock moves!



Clockwise VS. Counterclockwise

Rotations

All rotations need 3 things to be done:

1 - A point of rotation (the point that the original shape is moving around)
2 - An angle of rotation
3 - The direction!

Protractor & Ruler Method (90° CCW)

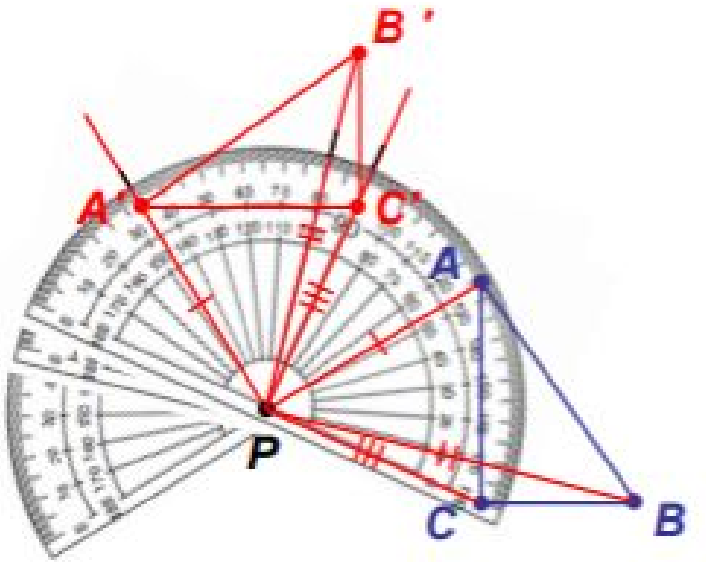
Step 1 - Draw a line from point P to A

Step 2 - Lay the protractor with it's centre on P, and on line PA

Step 3 - Put a mark showing 90 degrees. Then draw a line through P and the mark.

Step 4 - Measure line PA and make PA' the same length.

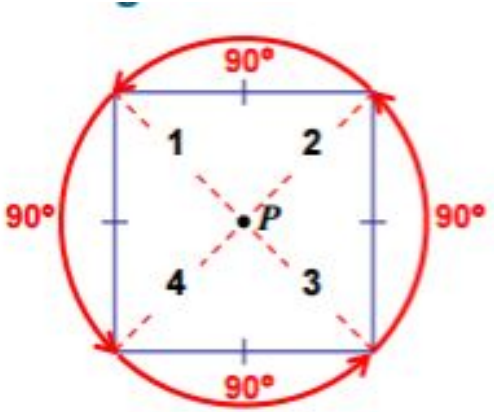
Step 5 - Repeat for B and C.



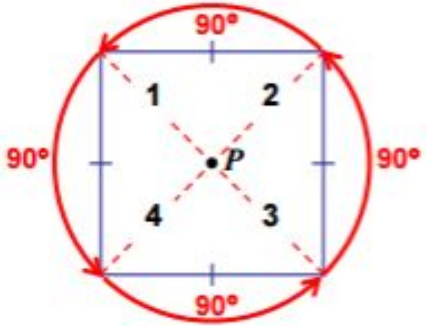
Rotational Symmetry

A figure in a plane has rotational symmetry if the figure can be mapped onto itself by a rotation of 180° or less about the centre of the figure.

The minimum amount of rotation required, is called the ***magnitude of rotation.***



Center of Symmetry



The point that is equidistant from each vertex is the **center of symmetry**.

1. Draw the lines of symmetry. Each line must connect to at least one vertex.

2. Label center point P.

3. How many lines, n, are there from P to the vertices?

4. Calculate the magnitude of rotation, $\frac{360°}{n}$.

$$\frac{360°}{4} = 90°$$