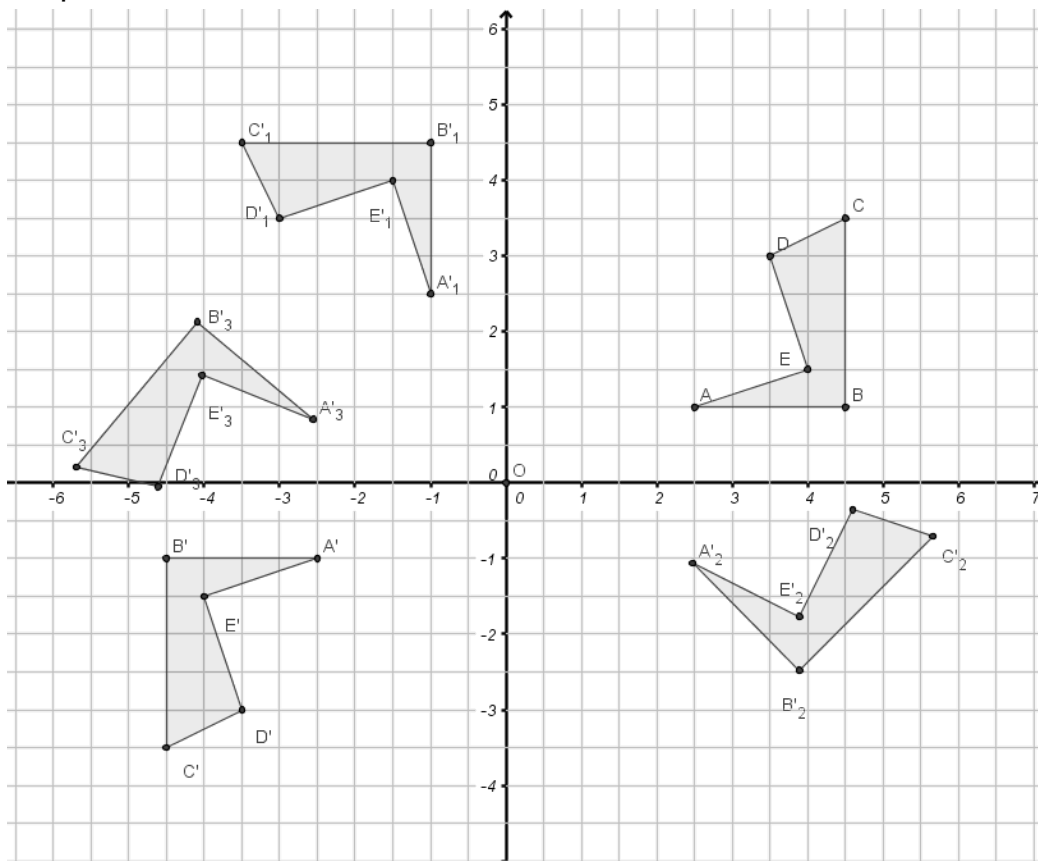


# WORKSHEET: ROTATION

Look at the picture below:



Calculate the distance of every point from the origin. What can you observe?

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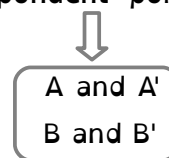
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Use a goniometer and measure the angles between the correspondent point of two figures. What can you observe?

The angles are -----

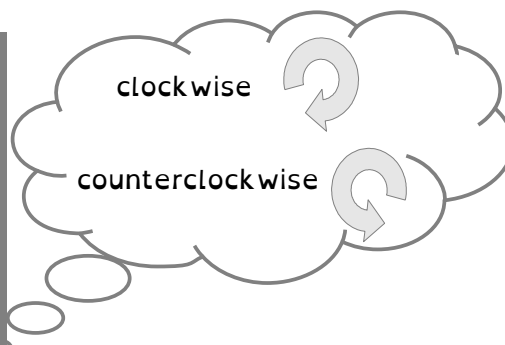
The figures are -----



## The process you observe is named ROTATION

A rotation is the movement of a geometric figure about a fixed point. The amount of the rotation is described in terms of degrees ( $^{\circ}$ ), clockwise or counterclockwise. You need to define a center of rotation.

The initial object is called the pre-image and the object after the rotation is called the image.



You can write “rotation through  $180^\circ$  clockwise about the point  $A(4;1)$ ”.

Where can you find rotation in nature or in real life?

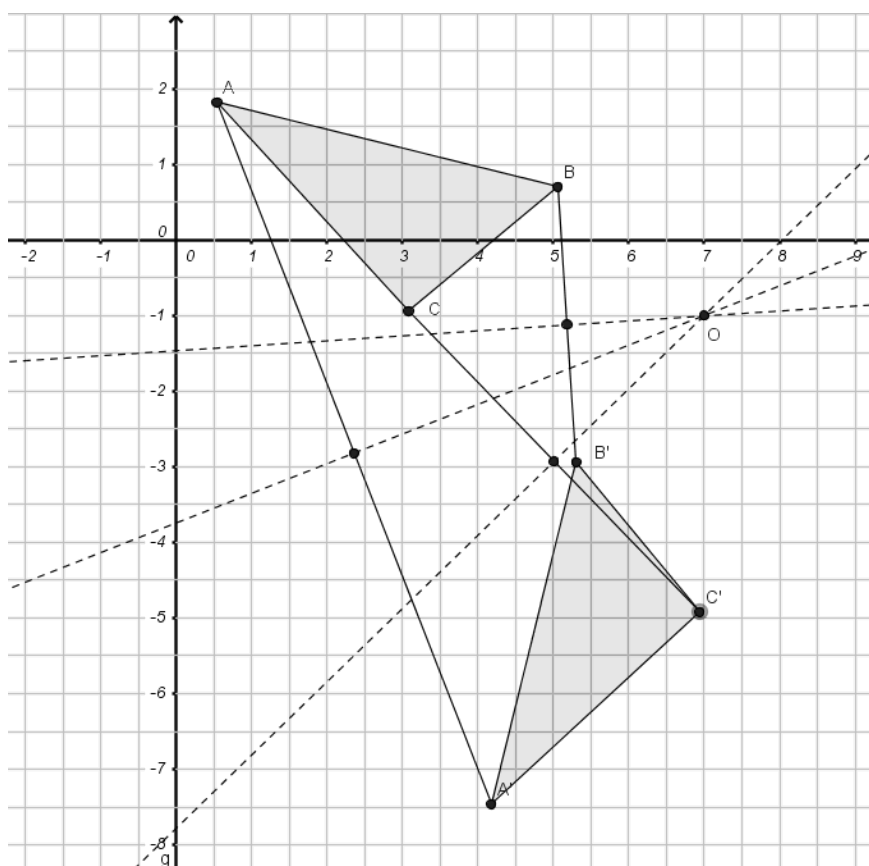
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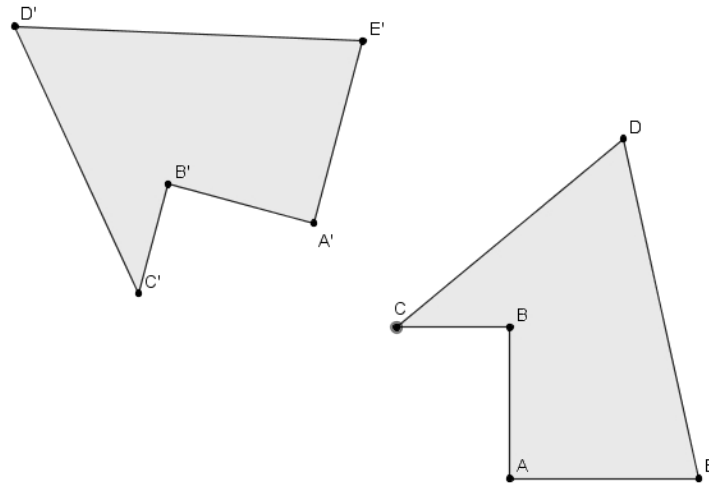
Example: determine the center of the rotation  $O$



1. Join the point  $A$  with  $A'$  and draw the perpendicular line which passes through (“attraverso”) the middle point.
2. Repeat the process for  $B$ ,  $B'$  and  $C$ ,  $C'$ .
3. Observe where the lines intersect. This is the center of rotation.

### EXERCISES:

1. Draw the figure which has coordinates  $A(1;2)$ ,  $B(2;5)$ ,  $C(6;5)$  e  $D(3;4)$ . Rotate this through  $90^\circ$  clockwise about the origin.
2. Draw the figure which has coordinates  $A(2;1)$ ,  $B(5;1)$ ,  $C(5;3)$  e  $D(3;3)$ . Rotate this through  $180^\circ$  counterclockwise about the point  $(1;2)$ .
3. The diagram below shows a shape which is rotated to give  $A'B'C'D'$ . Determine the center of the rotation and the degrees.



4. Construct a map to explain the rotation to your classmates.