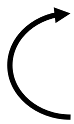
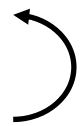
TOPIC 20-3: ROTATIONS

<u>Rotations</u>: A transformation about a point *P*, known as the center of rotation, such that each point and its image are the same distance from *P*.

Two types:  

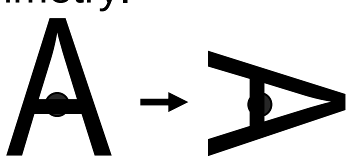
Determined by degrees:

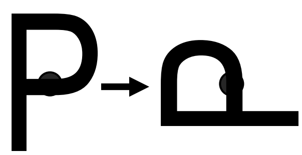
90°: **180°:**

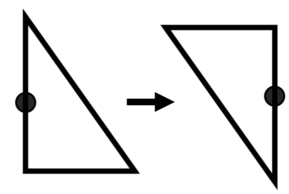
270°: **360°:**

<u>Rotational Symmetry</u>*:* A figure in the plane has rotational symmetry when the figure can be mapped onto itself by a rotation of 180° or less about the center of the figure.

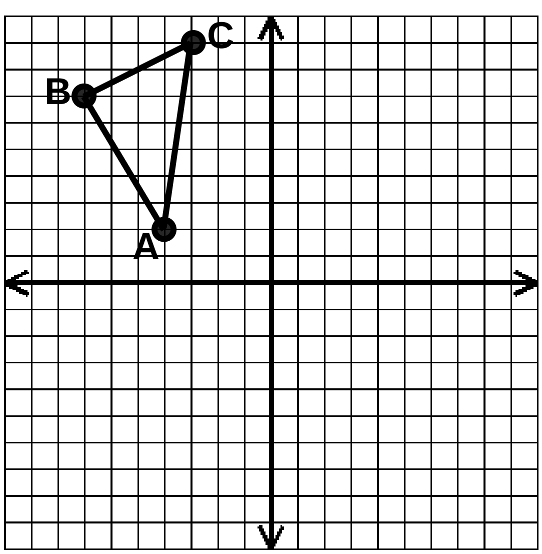
EXAMPLE 1: Describe each rotation & tell if the figure has rotational symmetry.

a) 

b) 

c) 

EXAMPLE 2: Draw the resulting triangles when the triangle is rotated 90°, 180°, and 270° clockwise about the origin.



<u>After 90° Rotation</u>:

A’(_____, _____)

B’(_____, _____)

C’(_____, _____)

<u>After 270° Rotation</u>:

A’(_____, _____)

B’(_____, _____)

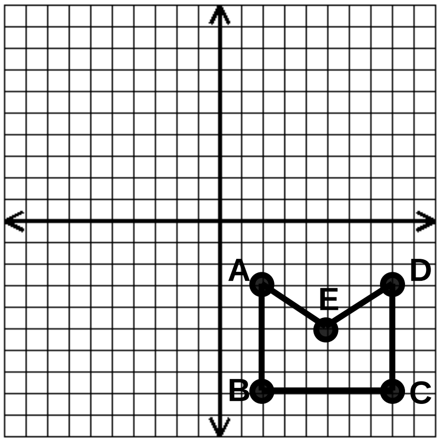
C’(_____, _____)

<u>After 180° Rotation</u>:

A’(_____, _____) B’(_____, _____)

C’(_____, _____)

EXAMPLE 3: Rotate the figure below 90° clockwise about the origin and define its new coordinates.



A'(______, ______)

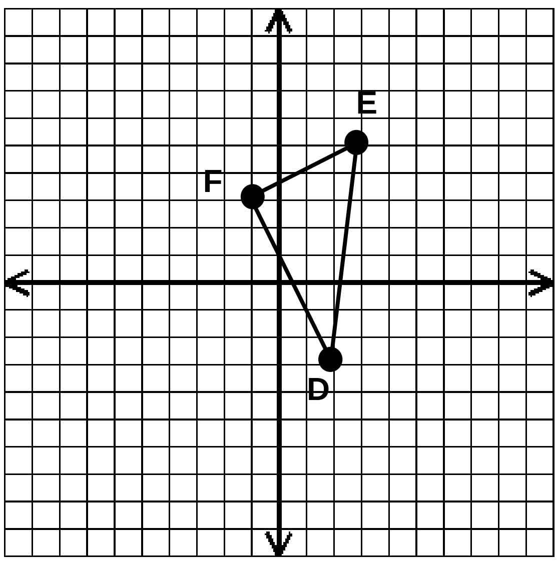
B'(______, ______)

C'(______, ______)

D'(______, ______)

E'(______, ______)

EXAMPLE 4: Rotate the figure below 180° about the origin and define its new coordinates.



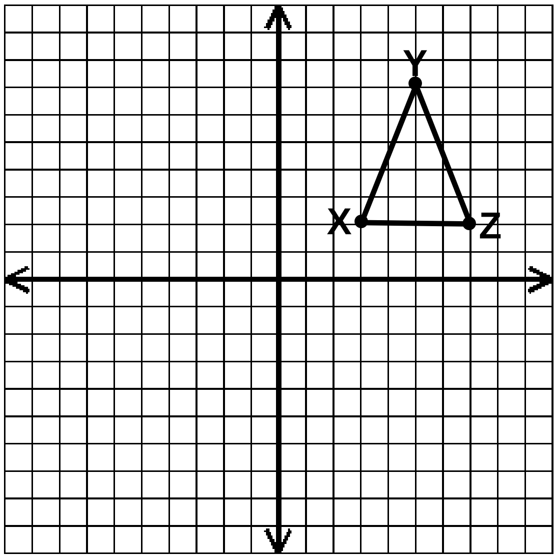
D'(______, ______)

E'(______, ______)

F'(______, ______)

EXAMPLE 5: Using the figure in EXAMPLE 4, find the equation of the line containing $\overline{FD}$.

EXAMPLE 6: Rotate the figure below 90° counter-clockwise about the origin and define its new coordinates.



X'(________, ________)

Y'(________, ________)

Z'(________, ________)

EXAMPLE 7: A ferris wheel has a radius of 106 feet and takes 40 seconds to make a complete rotation. A car starts at position (106, 0). What are the approximate coordinates of the car's location after 5 seconds?