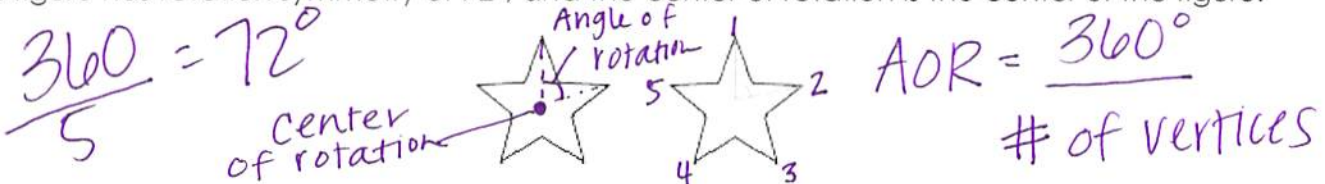


Rotational Symmetry

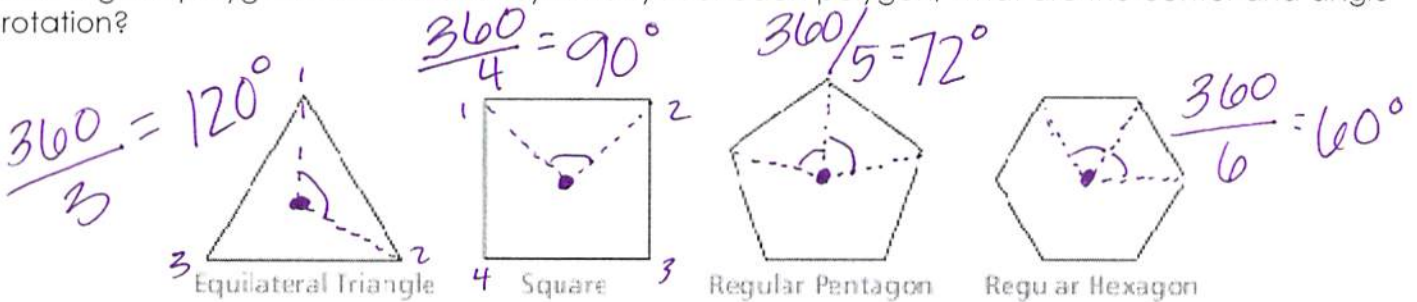
Name _____ Class Period _____

If you can rotate (or turn) a figure around a center point by fewer than 360° and the figure appears unchanged, then the figure has **rotational symmetry**. The point around which you rotate is called the center of rotation, and the smallest angle you need to turn is called the angle of rotation.

This figure has rotation symmetry of 72° , and the center of rotation is the center of the figure:



Do the regular polygons have rotation symmetry? For each polygon, what are the center and angle of rotation?

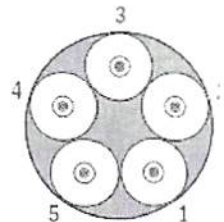


CD Player: Your CD player can hold five compact discs on a rotating tray like the one shown.

a. Does the tray have rotational symmetry? Explain.

Yes, because I can turn it less than 360° & it will look the same.

b. The tray can move only clockwise. A CD in position 1 is currently playing. How many degrees must the tray rotate to play a CD in position 3?

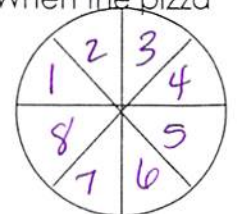


AOR: $\frac{360}{5} = 72^\circ$ 2 turns
 $2 \times 72 = 144^\circ \text{ CW}$

You and a friend decide to split a large pizza. Each half has different toppings on it. When the pizza arrives your friend's toppings are facing you.

a. If there are 8 slices of pizza what is the angle of rotation?

$\frac{360}{8} = 45^\circ$



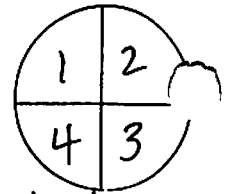
b. If slice 5 is directly in front of you, how many degrees CCW do you need to turn the pizza in order to get slice 2 which has the most toppings?

5 turns $5 \times 45^\circ = 225^\circ \text{ CCW}$

c. If slice 4 is in front of you, how many degrees CW do you need to turn the pizza in order to get slice 1 in front of you?

3 turns $3 \times 45^\circ = 135^\circ \text{ CW}$

1. You and a friend order a pizza. Each half has different toppings on it.

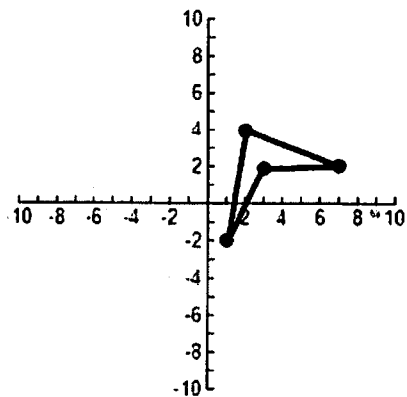


a. If there are 4 slices of pizza what is the angle of rotation?

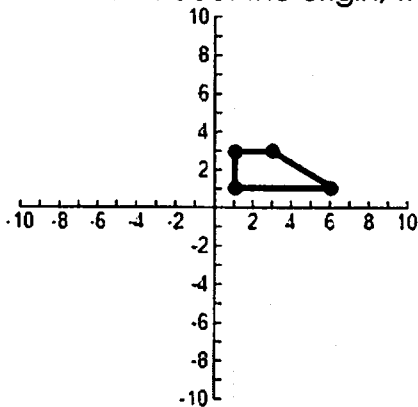
b. If slice 1 is directly in front of you, how many degrees CW do you need to turn the pizza in order to get slice 3 which has the most toppings?

c. If slice 3 is in front of you, how many degrees CCW do you need to turn the pizza in order to get slice 2 in front of you?

2. Reflect across the line $y = x$, Reflect across the y -axis, and Rotate 90° counterclockwise about the origin.



3. Rotate 270° clockwise about the origin, Translate $(x,y) \rightarrow (2x-3, 2y)$, and Reflect across the line $y = 2$.



4. **Treasure Hunt:** You are located at the point $(3, 4)$ in a coordinate plane. You need to find your way to a treasure chest. Starting at $(3, 4)$, move from one image point to the next by following the order of the transformations listed. The final image point is the location of the treasure chest.

1. Rotate 180° .
2. Reflect in the y -axis.
3. Translate 5 units to the left and 4 units up.
4. Reflect in the x -axis.
5. Rotate 90° clockwise.

