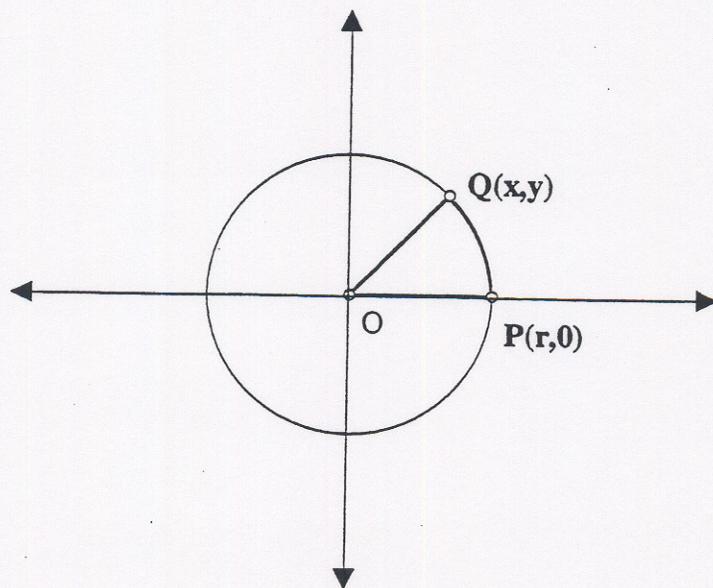


Activity 1: Circular Functions

- Use the paper plate to trace a circle on the cardboard. Locate the center of the circle. Draw a coordinate system on the paper plate with the origin at the center of the circle.
- Place a pushpin at the center of the circle. Place pushpins around the circle about every centimeter.
- Attach a piece of string to the point that is at the intersection of the circle with the x -axis.
- Use a marker to mark one radius of the circle on the string. Wrap the string around the circle until you have measured an arc that is the length of one radius.
- Wrap the string back around through the center of the circle. You have formed a central angle of the circle. The central angle of this circle is said to have a measure of one **radian**.

Radian Measure



One **radian** is the measure of a central angle that intersects an arc that has length of one radius of the circle.

If the measure of arc PQ is r , the radian measure of central angle O is 1 radius.

1. What is the approximate degree measure of an angle of 1 radian?
2. Wrap the string around the circle to find the approximate degree measure of each of the central angles shown in the table and complete the table.

Radian measure	1	2	3	4	5	6	7	8	9	10	11	12	13
Degree measure													

3. What is the relationship between the degree measure of an angle and the radian measure of an angle?
4. The trigonometric functions may be considered as functions with domain values that are angles measured in radians instead of degrees. What would be one period of such a function? Explain how you know.
5. Use your graphing calculator in radian mode. Graph the sine function. Sketch the graph.
6. Use the graph and the tables of the calculator to describe the domain and range of this function.
7. Sketch the graph of the cosine function in radian mode. Describe the domain and range of this function.