

## Visualizing a Unit Circle

1. Cut out a large circle or use a large paper plate.
2. Fold the circle in half to get one diameter. (Fold 1)
3. Fold the circle in half again to get another diameter (Fold 2).
4. Draw in the x- and y-axis. Label the radius as 1 unit. Label the coordinates of the points and their radians. Complete the chart below.

Coordinates	(     ,     )	(     ,     )	(     ,     )	(     ,     )
Radians				

5. Refold the circle to position of Fold 2. Fold the quarter circle again in half. Draw in this lines.  
 Each of these new lines is at  $\frac{\pi}{4}$  from the original x- or y-axis. In the first quadrant, drop a vertical line segment from the endpoint of the radius. What special triangle has been formed? Use this to calculate the sides of the right triangle. This should help you name the coordinates for this endpoint. Thinking about reflections over the x- and y-axis, name the coordinates of the endpoints for the other radii.
6. Label the coordinates of the points. Label their radians also. Complete the chart below.

Coordinates	(     ,     )	(     ,     )	(     ,     )	(     ,     )
Radians				

7. Refold the circle to the position of Fold 2. Once you have the quarter of a circle, fold the quarter into thirds. This can be done by folding one piece inside the other until you have 3 equal pieces overlapping. Open the circle or plate. Notice how each quadrant has been divided. Notice there are not 4 equal pieces in each quadrant. Create right triangles in the first quadrant from the endpoint of each radius. What special right triangle has been formed? Calculate the length of each side of the special triangle.
8. Draw in these 4 lines. Label these new points. Identify the radian measure also. Complete the chart below for these eight points.

Coordinates	(     ,     )	(     ,     )	(     ,     )	(     ,     )
Radians				
Coordinates	(     ,     )	(     ,     )	(     ,     )	(     ,     )
Radians				

