# Pre Calculus

Date:

Items Needed: .Book, Unit_circle, Mathgraphs #71 & 72 (Same graph will work for each), & blank unit circle for everyone to practice with.

Objective: The students will be able to describe an angle and to convert between degree and radian measures.

PA Common Core: cc.2.2.hs.c.7

Lesson:

- Lets review the unit circle. As the name implies, it is a circle where the radius is 1 (one unit). The unit circle equation is $x^2 + y^2 = 1$ and the graph looks like this:
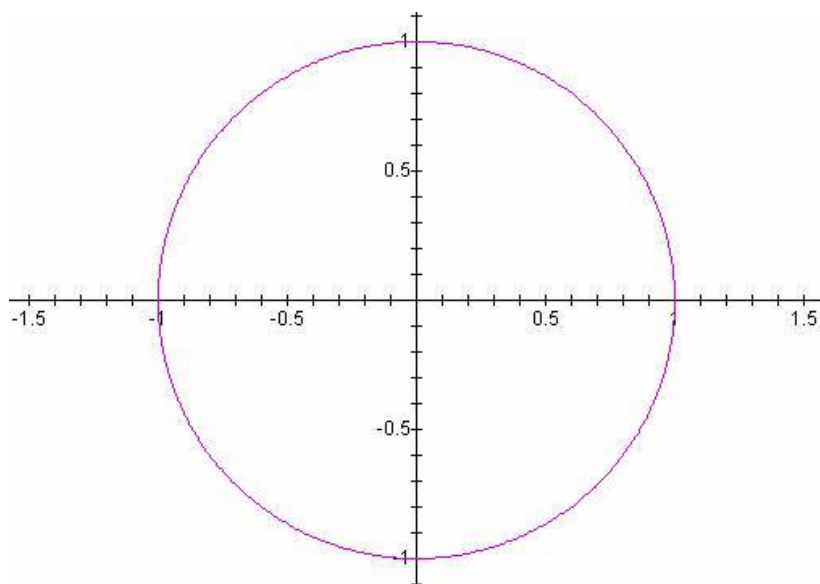
- Now, if we start at the point (1, 0) and walk a distance t around the circle, we will arrive at a point (x, y) represented by the blue point on the circle in the figure below. The distance traveled, t, is shown in red. At the right of the circle is a red line segment that ends in a blue point that is exactly the same length as the red arc ending in the blue point.
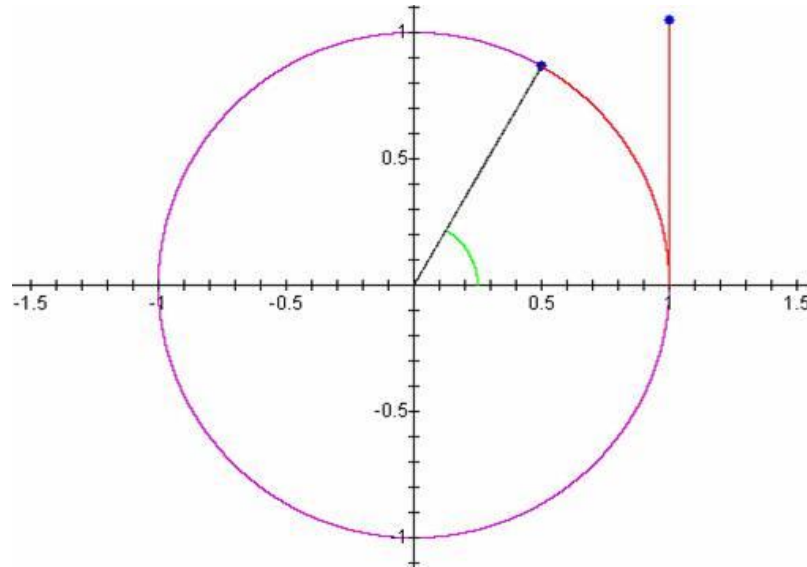
- **Remember, One radian** is the measure of central angle θ that intercepts an arc s equal in length to the radius r of the circle.

- If the angle above was approximately 57.30 degrees, then the radius length would equal the arc length and that would be considered to be 1 radian.
- You can easily evaluate the exact values of trig functions for common values.
- 57.30 is not considered to be a common angle.
- The chart below provides these common values.
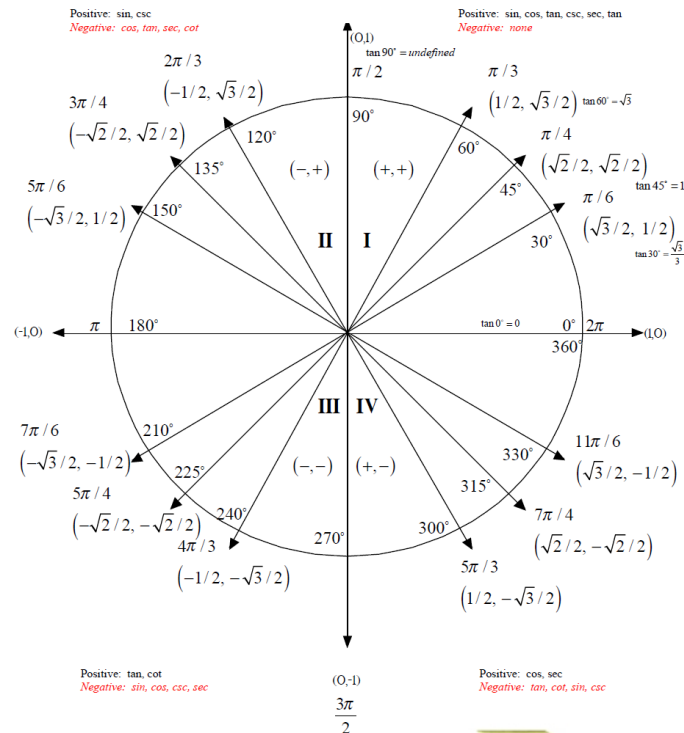
- Look at the chart and discuss the values and their similarities.
- What makes these values common?
- Remind students about the Pythagorean Theorem.
- Take chart and draw a triangle from a couple of coordinates and prove the existence of a right triangle.
- Now, remind students about SOH – CAH – TOA
- $\sin\theta = \dfrac{Opp}{Hyp}$, $\cos\theta = \dfrac{Adj}{Hyp}$, $\tan\theta = \dfrac{Opp}{Adj}$
- Now match up angles with the properties mentioned above and find the three values of 30 degrees and $\dfrac{\pi}{3}$
- Now look at the definitions of the trig functions given on p. 266.
- Do they match up?
- Point out the addition of the other 3 trig functions.
- Find the other 3 trig functions for 30 degrees and $\dfrac{\pi}{3}$.
- **Will have to know these. Teach memory aid later.**
- Looking at the unit circle ask what is the domain of the Cosine function?
- Discuss the x and y values of each.
- Discuss how coterminal angles are present and a periodic function is created.
- Show that the sine function is similar to the cosine function.
- Show how a periodic function is denoted.

- Discuss the even and odd trig functions on p. 269. You may need to rewrite the function given a negative value to start with.

Assignment: .Have students do 6, 8, 12, 15, 19, 22, 24, 27, 30, 40-46 (even), p. 270.
Have students do 53-67 (odd), 73, 75, p. 271

Evaluation: (Could be from any one/several of the following)
Responses from classroom questions
Results of classroom sample problems
Homework responses
Check answer with Calculator
End of the section exam

Enrichment: