SM3 9.1 Homework Questions

1. What is the name of the first curve? What is the name of the second curve?

$$y = \sin(\theta), y = \cos(\theta)$$

2. *What measurements of the circle does each function measure?

sin measures the height of the circle at θ; cos measures the width of the circle at θ

3. Write 3 sentences that describe how the functions are similar:

The functions have the same shape.
The functions have the same amplitude (maximum and minimum value).
The functions have the same period (interval of θ before repeating itself).

4. Write 3 sentences that describe how the functions are different:

The functions have different y-intercepts.
The functions have different x-intercepts (roots, solutions, zeros, etc.).
The functions measure different properties of the circle.

For questions 5 through 7, describe how your function's shape changes given each procedural change:

5. The radius of the circle is twice as long: The wave functions have twice the amplitude.

6. The radius of the circle is half as long: The wave functions have half the amplitude.

7. Instead of 16 points of interest, we measure with 200 points of interest:

The wave function is ideally unchanged but perhaps more accurate.

8. At which angle measurements do the functions intersect? $45°, 225°$

9. Which function tells you the x coordinate? Which function tells you the y coordinate?

cos( ) gives the x coordinate; sin( ) gives the y coordinate.

10. Assume the radius of the circle is 1; find the x- and y-coordinates (from the circle) of the points of intersection: $\left(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right), \left(-\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right)$