

Monday, September 16

Compare and Contrast: Radians and Degrees

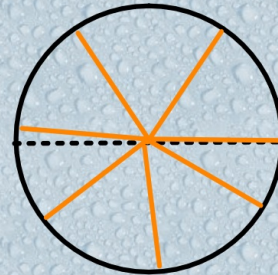
Radians Degrees

$$2\pi_r = 360^\circ$$

$$6.282 \approx 360^\circ$$

$$5 \neq 5\pi$$

$$1_r \approx 57^\circ$$



September 16

Students will verbally explain how to
graph sine and cosine functions

(using the words:
range, right triangles, periodic...)

According to a theory called biorhythm, everyone has three inner rhythms that start at birth: a 23 day physical cycle, a 28 day emotional cycle, and a 33 day intellectual cycle. Each cycle consists of a high period, a low period, and a critical transition day when a person moves from one period to the other. These three cycles can be graphed so that a person can determine in advance when "good" and "bad" days will occur. The graph of each biorhythm cycle is a sine wave.

You will rank each category, each day for the next 33 days. You can choose your ranking system.

You will also need to know how many days old you are.

Calculate the number of days you have lived as of **August 31**.

- Multiply your age times 365.
- Add the number of leap years you have lived through (they occur every 4 years; the last one was in 2012).
- Add the number of days since your last birthday till ~~today~~ **Aug 31**.
- The final figure will be the number of days you have been alive.

Ex. Born **September 23, 1997**:

$$15 \times 365 = 5475 \rightarrow 5475 + 4 = 5479 \rightarrow$$

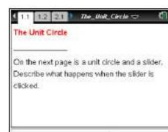
$$5479 + 7 \text{ (end of Sept)} + 31 \text{ (Oct)} + 30 \text{ (Nov)} + 31 \text{ (Dec)} + 31 \text{ (Jan)} + 28 \text{ (Feb)} + 31 \text{ (March)} + 30 \text{ (April)} + 31 \text{ (May)} + 30 \text{ (June)} + 31 \text{ (July)} + 31 \text{ (August)} = 5817$$

The Unit Circle Student Activity

Name _____
Class _____

Open the TI-Nspire document *The_Unit_Circle.tns*.

In this activity, you will click on a slider to change the measure of the central angle and create a series of line segments that determine the graph of a sinusoidal function.



Move to page 1.2.

- The circle pictured is called a unit circle. Why is that term used?
- Use the slider, to make three segments appear. What is the relationship between the right triangle in the unit circle and the vertical line segments?
- Will the lengths of the line segments continue to increase? Why or why not?
- Continue to use the slider until you obtain values of θ such that $\frac{\pi}{2} < \theta < \pi$. Are any of the line segments the same size? Why or why not?
- Use right triangle trigonometry to explain the relationship between the angle θ and the highlighted leg of the right triangle in the unit circle. What trigonometric function can be represented by the length of the leg of the right triangle?
$$\sin \theta = \frac{\text{opp}}{\text{hyp}} = \frac{\text{opp}}{1}$$
- Use the slider until you obtain values of θ such that $\pi < \theta < \frac{3\pi}{2}$. Explain the placement of the line segments.
- Continue to use the slider until $\theta = 2\pi$ to graph a continuous function. What do the coordinates of the points on the continuous function represent?