Wednesday, September 18

What are the similarities and differences between the following three graphs:

$f(x) = x^2 - 7$

$g(x) = (x - 4)^2$

$h(x) = 9x^2$

September 18

Students will verbally explain how to graph sine and cosine functions

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

Sine Function

Domain: all real numbers

Range: $-1 \le y \le 1$

Zeros: $0, \pi, 2\pi, \ldots, n\pi$

Length of one period: 2π

Cosine Function

Domain: all real numbers

Range: $-1 \le y \le 1$

Zeros: $\frac{\pi}{2}, \frac{3\pi}{2}, \frac{5\pi}{2}, \ldots, \frac{(2n+1)\pi}{2}$

Length of one period: 2π

4

$-1 \le x \le 1$

4

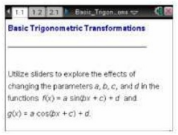
all real numbers all real numbers $-1 \le x \le 1$

Basic Trigonometric Transformations
Student Activity

Name _____
Class _____

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

In this activity, you will manipulate sliders to change the values of parameters in trigonometric functions and to determine the effect that each change has on the shape of the graph. You will then use this knowledge to write equations for sine and cosine functions.



Move to page 1.2.

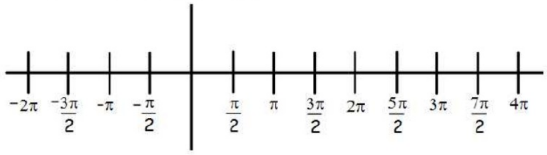
Press ctrl ▶ and ctrl ◀ to navigate through the lesson.

1. Drag the sliders to change the values of a in the function $f(x) = a \sin(x)$.
   a. Describe how the values of a affect the shape of the graph.
   b. What happens to the graph if a is negative?
   c. Complete the following statement:
      For $a \neq 0$, the graph of $f(x) = a \sin(x)$ has an amplitude of a.

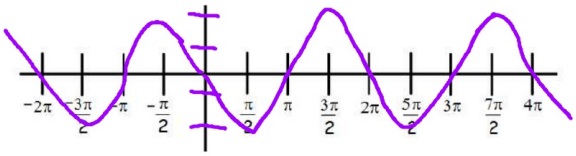
Move to page 2.2.

2. Drag the slider to change the value of d in the function $f(x) = \sin(x) + d$.
   a. Describe how the value of d affects the shape of the graph.
   b. Complete the following statement:
      The graph of $f(x) = \sin(x) + d$ has a vertical shift of d.
3. Describe the difference between a change in the amplitude and a vertical shift.

Label your y-axis and sketch a graph of y = 4 sin(x)



Label your y-axis and sketch a graph of y = -2 sin(x)



Label your y-axis and sketch a graph of y =cos(x) + 3