

Warm Up 1/07**Lesson 5-3: Trigonometric Graphs II****Objectives**

Students will...

- Be able to know what the standard equation of a sine and a cosine curve is.
- Be able to find the period and the amplitude of a sine or a cosine function algebraically.

Periodic Behavior of sin and cos

Before we can graph sin and cos functions, we need to take a closer look at their behavior.

One common behavior that we can quickly spot for any trigonometric function is the _____ of the values.

Ex: $\sin 0 = 0 = \sin 2\pi$, $\sin \frac{\pi}{2} = 1 = \sin \frac{5\pi}{2}$, etc. $\cos 0 = 1 = \cos 2\pi$, $\cos \frac{\pi}{2} = 0 = \cos \frac{5\pi}{2}$, etc.

For this reason, sin and cos functions are said to be _____. This is why the unit circle is perfect for representing their values, because every circle is periodic (i.e. _____).

Standard Equation of Sine and Cosine Curves

Like any other functions, there exists a standard equation of both sine and cosine curves.

Sine Curves: Any equation of a sine curve is written in the form:

$$y = \text{_____}, \text{ where } a \text{ and } k \text{ are _____ with } k > 0$$

Cosine Curves: Any equation of a cosine curve is written in the form:

$$y = \text{_____}, \text{ where } a \text{ and } k \text{ are _____ with } k > 0$$

Period and Amplitude of Sine and Cosine Curves

In our previous lesson we simply used the graph to figure out the period and amplitude of a given sine or cosine curve. However, we may not (more of than not) have a graph to refer to. In fact, how would we find the period if we were asked to graph a given sine or cosine curve? Of course, we can use the x-y table to graph the curve first, but this isn't always practical.

Fortunately, finding the period and the amplitude of a sine or cosine curve can be found algebraically from their equation.

For sine and cosine curves of the form: $y = a \sin kx$ and $y = a \cos kx$,

Period = _____

Amplitude = _____

Example

Find the period and amplitude of each function.

1. $y = 4 \cos 3x$

2. $y = -2 \sin \frac{1}{2}x$

3. $y = 2 \cos 3x$

4. $y = \pi \sin 4x$

Homework 1/07

TB pg. 429 #15-24 (ONLY FIND PERIOD AND AMPLITUDE) DO NOT GRAPH!