PreCalculus Name: Period: Date:

Warm Up 1/22

Lesson 5-3: Trigonometric Graphs III

Objectives

Students will…

- Be able to identify and graph the shift of sine and cosine functions.

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:

$y =$ _____, where a and k are _____ with $k > 0$

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

$y =$ _____, where a and k 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** = _____

Horizontal and Vertical Shift

Recall from chapter 2 about the shift of parabolas. The standard equation of a parabola is $y = x^2$. Now, consider…

Ex.

$y = x^2$ $y = (x - 4)^2 - 9$

Vertex:

Shift:

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Horizontal and Vertical Shift

Believe it or not, trig functions (along with many other functions) take the similar format when it comes to their shifts.

Ex. $y = \cos x$ $y = \cos(x - \frac{\pi}{2}) + 1$

Period:
Amplitude:
Shift:
Start/End Point:

Example

Let's graph the two and compare. $y = \cos x$, $y = \cos\left(x - \frac{\pi}{2}\right) + 1$

Example

Believe it or not, trig functions (along with many other functions) take the similar format when it comes to their shifts.

Ex. $y = \sin x$ $y = 3\sin 2(x - \frac{\pi}{4})$

Period:
Amplitude:
Shift:
Start/End Point:

Example

Let's graph the two and compare. $y = \sin x$, $y = 3\sin 2\left(x - \frac{\pi}{4}\right)$

Guidelines to Graphing

1. Identify
2. Find
3. Find
4. Identify
5.

Homework 1/22
TB pg. 429 #1, 11, 19, 27, 33, 36 (Be sure to graph!)