Integrated Math 3
Unit 5: Graphing & Modeling Trig. Functions
5.1

Name: _____

Date: _____ Period: _____

Objective: To understand how trig functions and the unit circle are related.

Vocabulary:

Periodic Functions: A function that has a repeating pattern that continues indefinitely

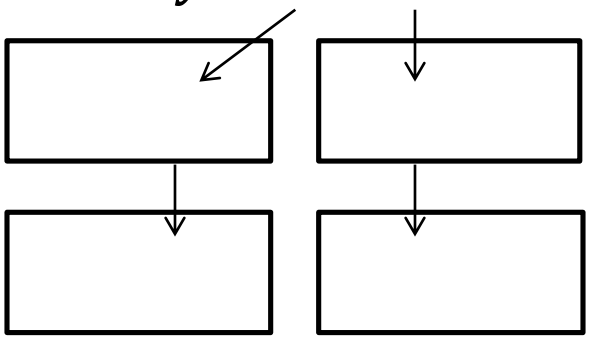
Cycle: The shortest repeating portion of the graph

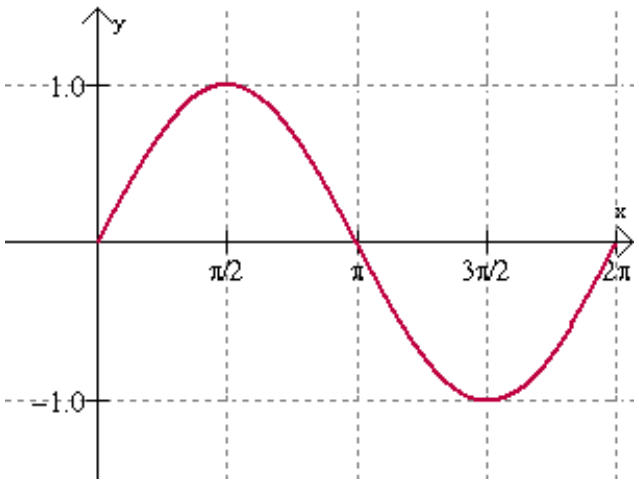
Period: The horizontal length of each cycle $\left(\frac{2\pi}{b}\right)$

Amplitude: The distance from the midline to the maximum value and the distance from the midline to the minimum value of the function (amplitude $= a$)

Standard "Parent Graph" Functions

$$y = a \sin bx$$

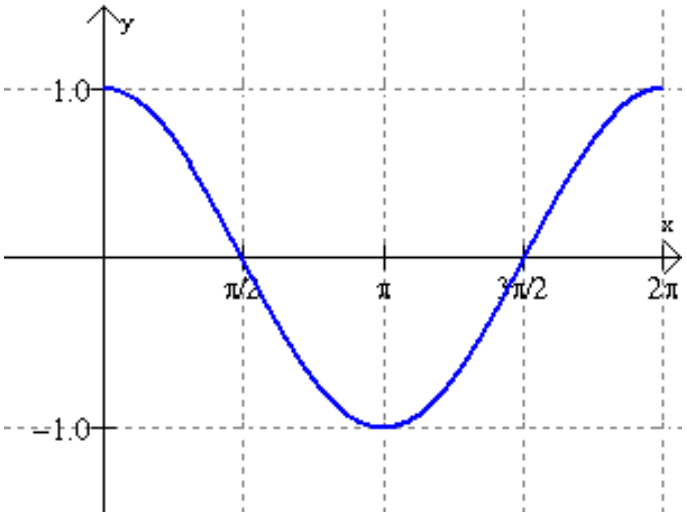




A sine graph <u>without any transformations</u> have the following characteristics:

- Amplitude:
- Period:
- Domain:
- Range:

$$y = a\cos bx$$



A cosine graph <u>without any transformations</u> have the following characteristics:

- Amplitude:
- Period:
- Domain:
- Range:

<u>Example 1:</u> Identify the amplitude and range of the trigonometric functions below.

A.) $y = 3\sin x$ B.) $y = \cos 4x$ C.) $y = \frac{1}{4}\sin 2x$

<u>Example 2:</u> Write sine and cosine functions that have the following characteristics

A.) A sine function that has an amplitude of 5

B.) A cosine function that has an amplitude of 3

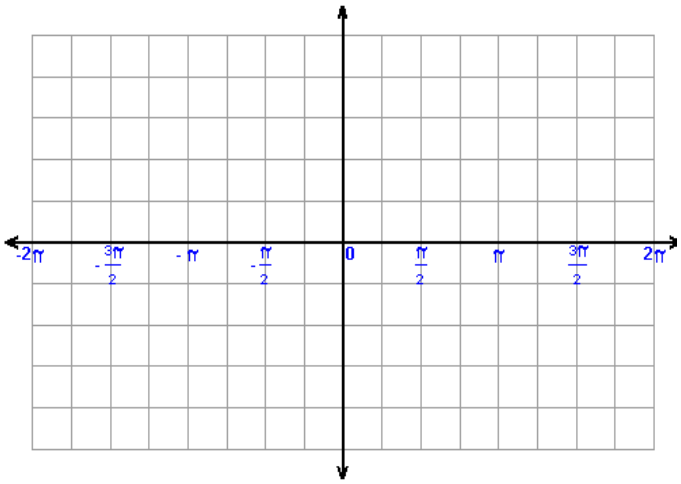
C.) A sine function that has a period of π

D.) A cosine function that has a period of 4π

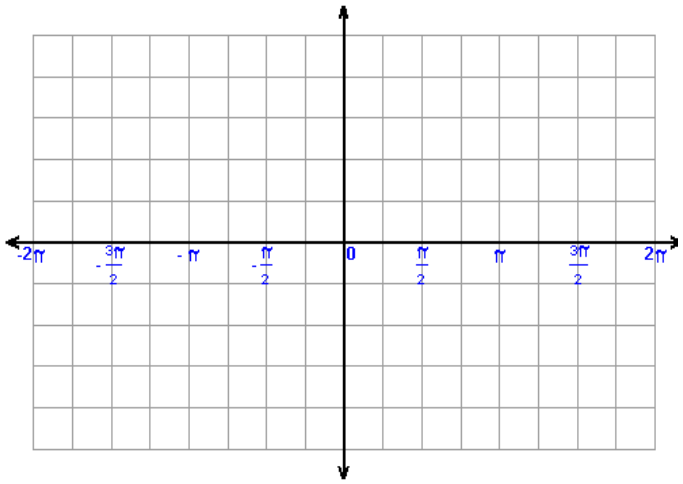
E.) A sine function that has a period of π and an amplitude of 5

Example 3: Graph the sine and cosine functions with period and amplitude transformations.

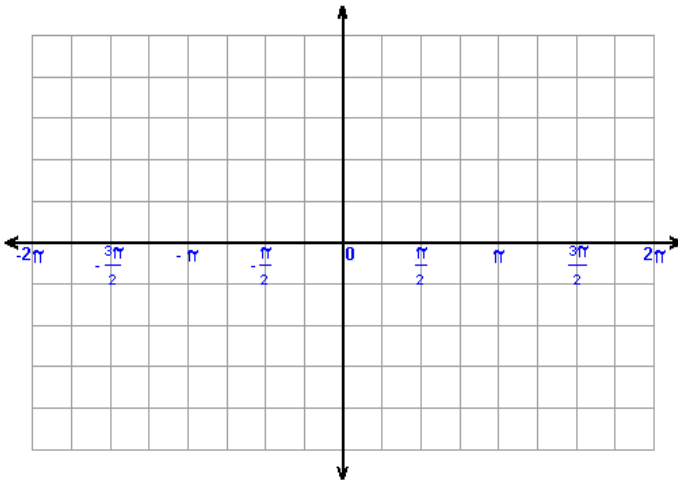
A.) $y = 2\sin x$



B.) $y = \cos 2x$



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



D.) $y = -2\cos 4x$