Integrated Math 3
Unit 5: Graphing & Modeling Trig. Functions
5.2

Name: _____

Date: _____ Period: _____

Objective: To graph trigonometric functions with vertical shifts and reflections.

Vocabulary:

Midline: the horizontal axis that is used as a reference line about which the graph of a periodic function oscillates.

Transformed Equation

$$y = a\sin(bx) + d$$

- a: Amplitude $|a|$
- b: Period $= \frac{2\pi}{b}$
- d: Vertical Shift

* The vertical shift moves the midline up or down "d" units.

Identify the amplitude, period, and vertical shift for each of the following examples. Then, graph the function.

Example 1: $f(x) = 3\cos 2x + 1$ Range: $[-2, 4]$

Amplitude: 3

Period: $\frac{2\pi}{2} = \pi$

Vertical Shift: $y = 1$ ("up 1")

Example 2: $g(x) = -2\cos\left(\frac{x}{2}\right) - 2$ Range: $[-4, 0]$

Amplitude: 2 *reflected*

Period: $\frac{2\pi}{1/2} = 4\pi$

Vertical Shift: $y = -2$ ("down 2")