**Module 3 Lesson #4: The Sine Function**



Learning Targets:

* I can graph one cycle of a sine curve.
* I can determine the period of a sine curve and can explain what it means.
* I can determine the amplitude of a sine curve and can explain what it means.
* I can determine the midline of a sine curve.
* I can apply my knowledge of sine curves to real life situations.

**The Sine Function**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| $$θ$$ | 0o | 90o | 180o | 270o | 360o |
| $$sinθ$$ |  |  |  |  |  |

*You just graphed one cycle of* $y=sinx$ *☺*

$$y=asinbx+d$$

 $amplitude=$

***frequency =***

$$period = $$

$$midline=$$

***Example 1:*** Graph one cycle of $y=2sinx$

***Example 2:*** Graph one cycle of $y=-sinx$

Based on the graph, what is the value of $y=-sinx$ when $x=\frac{3π}{2}$.

***Example 3:*** Graph one cycle of $y=2sin2θ$

What is the maximum height of $y=2sin2θ$? What is the value of $θ$ at the maximum height?

If you were to graph $y=2sin2θ$ from $[0,2π]$, how many cycles would you see?

**Example 4:** Graph one cycle of $f(x)=-3sin3θ$

State the range of $f(x).$

Graph one cycle of $f\left(x\right)=-3sin3θ+2$. What transformation is taking place?

**Example 5:** Graph one cycle of $y=5sin\frac{x}{2}-3$

**Example 6:** Graph one cycle of $y=3sin\frac{π}{2}θ$

**Writing the Equations of Sine Functions**

**Example 1:** Sketch one cycle of a sine curve with an amplitude of $\frac{1}{3}$ and a period of $π$. Write the equation of this curve.

**Example 2:** Find the period for each of the sine curves below. The write an equation for each function. Each graph goes from $[0, 2π]$

**Function A**  **Function B**

