Precalculus **Digital Learning**
Week of 4/13 **Lesson 1**

Review of Amplitude, Period and Midline

Print these 3 pages if you can. The first 2 pages are discussed in the video, page 3 contains a couple problems for you to try. Video – Digital Learning Lesson 1
(a link to video can be found on my website)

Learning Targets:

I can determine the Amplitude, Period and Equation of the Midline of the Sine and Cosine functions

I can graph transformations of the Sine and Cosine functions

Our sine and cosine functions are typically written in the form: $\boldsymbol{f(x) = a\sin(bx - c) + k}$

The **amplitude** is basically the height of the wave. More specifically, amplitude is the distance between midline of the graph and either the maximum or minimum values. The amplitude is always positive.

Amplitude = $|a|$ and can be found by: $\text{Amplitude} = \frac{\max - \min}{2}$

The **period** refers to the length of the interval needed to complete one full "wave" of the graph.

$\text{Period} = \frac{2\pi}{|b|}$ and can be found as the distance between consecutive maximums

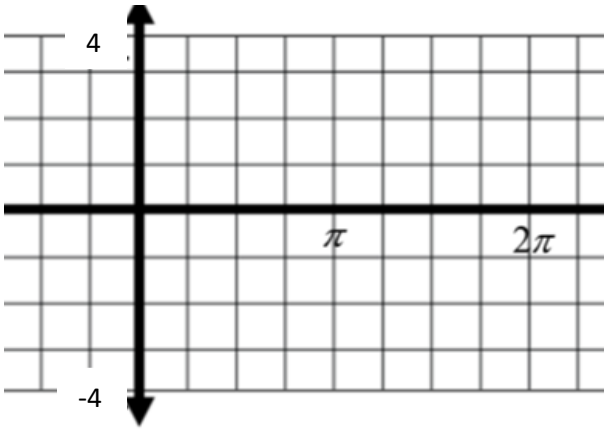
The **midline** is an artificial horizontal axis. It comes from the vertical shift

Equation of the midline is $y = k$ and can be found by: $y = \frac{max + min}{2}$

1) Identify the amplitude, period, equation of the midline and extremes in each of the following:

	Amplitude	**Period**	**Equation of the Midline**	**Extremes Min Max**
$h(x) = 4\sin(2x) + 1$				
$f(x) = -3\cos(x) + 2$				
$g(x) = \sin\left(\frac{2}{5}x\right) - 1$				
$k(x) = \frac{5}{2}\cos\left(\frac{\pi}{4}x\right)$				

2) a) Sketch a graph of $f(x) = 4\cos(2x)$ over the interval $[0, 2\pi]$



Amplitude:

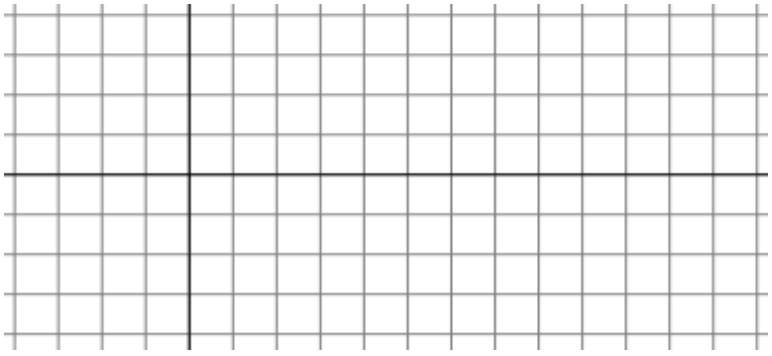
Midline:

Period:

b) Identify the coordinates of all zeros included in the graph

c) Circle the best choice: Odd Function Even Function Neither

3) a) Sketch a graph of $m(x) = -3\sin(x) + 1$ over the interval $[-\pi, 3\pi]$



Amplitude:

Midline:

Period:

b) Identify the coordinates of all relative extremes included in the graph

Minimum(s):

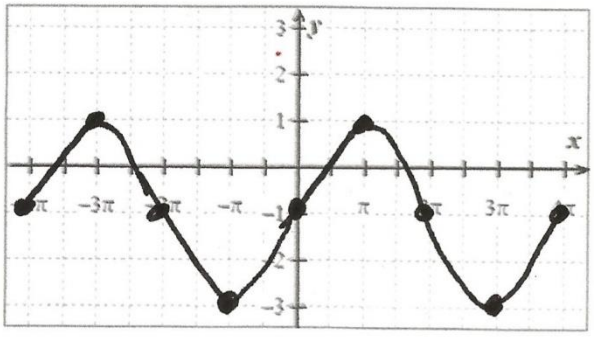
Maximum(s):

4) a) From the graph shown identify the

i) midline

ii) amplitude

iii) period

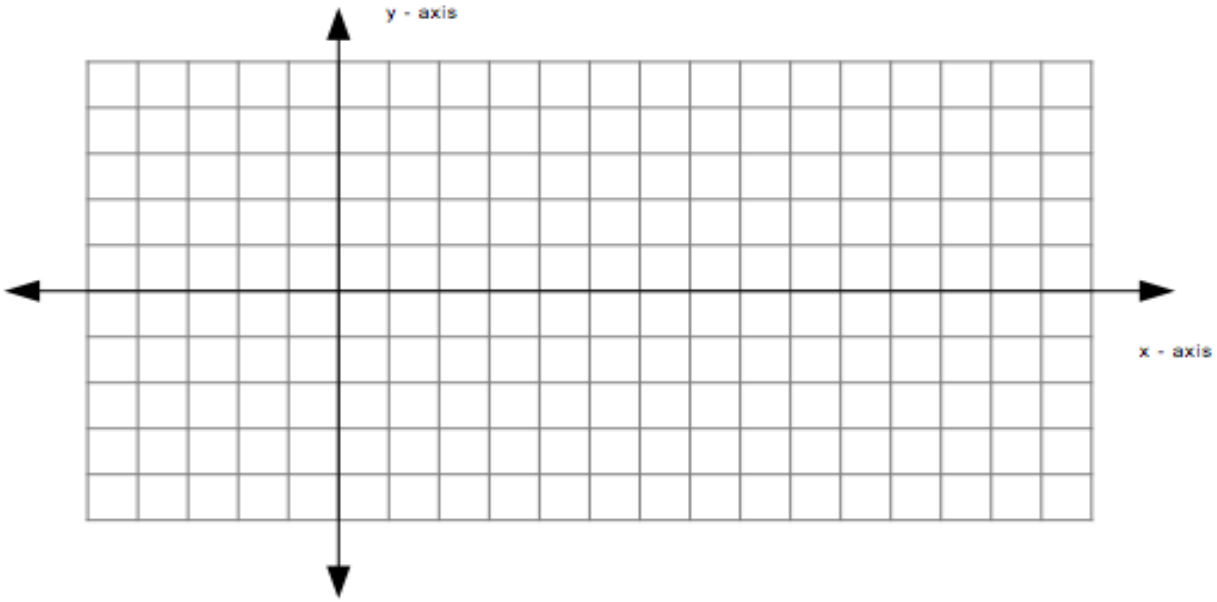


b) Write the equation of the function shown in the graph

Pause the video for a few minutes and try questions 5 and 6, then resume to check your results.

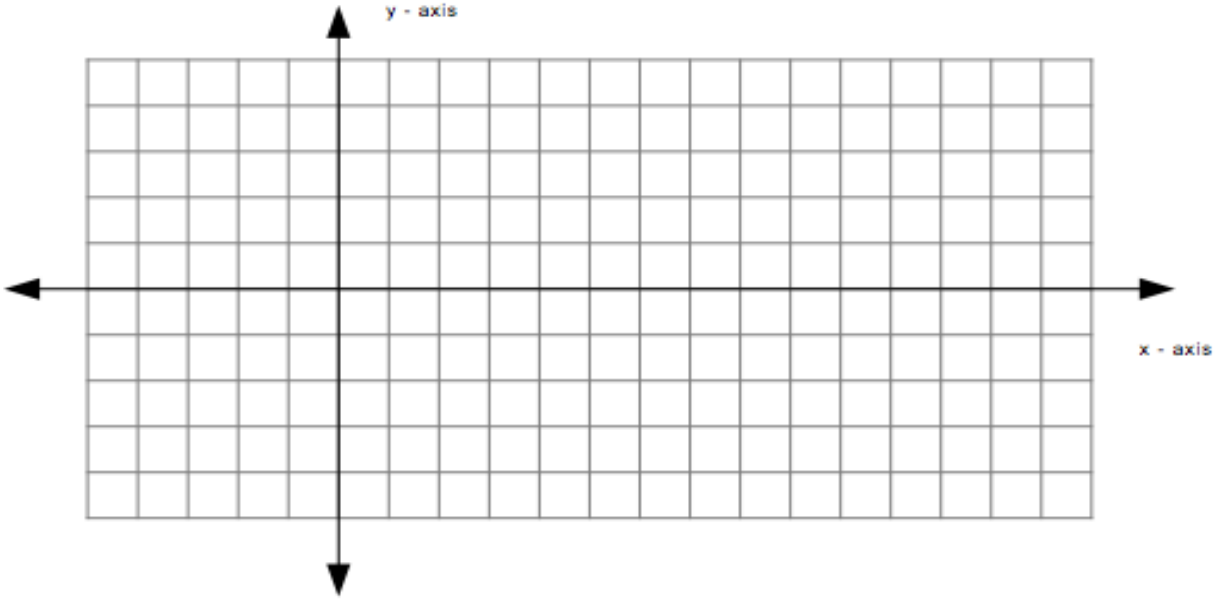
5) Graph the function $f(x) = 4\sin(x) - 1$ over the interval $[-\pi, 3\pi]$. Indicate the amplitude, period and equation of the midline.

Amplitude: Period: Equation of the Midline:



6) Graph the function $g(x) = 2\cos\left(\frac{\pi}{4}x\right) + 2$ over the interval $[-4, 12]$. Indicate the amplitude, period and equation of the midline.

Amplitude: Period: Equation of the Midline:



c) Indicate the coordinates of all minimums and maximums shown on this graph

Minimum(s):

Maximum(s):