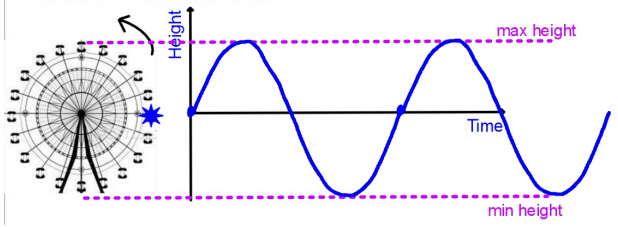
Wednesday, May 6, 2020

Sec 7-5: The graph of the Sine Function

Suppose the you get on a Ferris Wheel at the spot marked with the star. Sketch the graph of your height above/below the spot marked with the star as the Ferris Wheel turns.



Using a calculator we can fill out this table to find the values of Sinθ for some angles measured in radians. The first half of this table represents angles found on the Unit Circle. The second half would be coterminal angles to those in the first half.

θ	0	$\frac{\pi}{4}$	$\frac{\pi}{2}$	$\frac{3\pi}{4}$	π	$\frac{5\pi}{4}$	$\frac{3\pi}{2}$	$\frac{7\pi}{4}$	2π	$\frac{9\pi}{4}$	$\frac{5\pi}{2}$	$\frac{11\pi}{4}$	3π	$\frac{13\pi}{4}$	$\frac{7\pi}{2}$	$\frac{15\pi}{4}$	4π
Sinθ	0	.71	1	.71	0	-.71	-1	-.71	0	.71	1	.71	0	-.71	-1	-.71	0

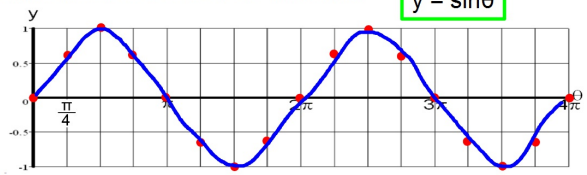
We can then use this table to see what the graph of y = Sinθ looks like.

Use a calculator to fill in the table. Round to the nearest hundredth.

θ	0	$\frac{\pi}{4}$	$\frac{\pi}{2}$	$\frac{3\pi}{4}$	π	$\frac{5\pi}{4}$	$\frac{3\pi}{2}$	$\frac{7\pi}{4}$	2π	$\frac{9\pi}{4}$	$\frac{5\pi}{2}$	$\frac{11\pi}{4}$	3π	$\frac{13\pi}{4}$	$\frac{7\pi}{2}$	$\frac{15\pi}{4}$	4π
Sinθ	0	.71	1	.71	0	-.71	-1	-.71	0	.71	1	.71	0	-.71	-1	-.71	0

Graph the data in this table to see what the Sine Function looks like.

y = sinθ



Demonstration of the graph of y=Sinθ

https://www.geogebra.org/m/G9mjcC7D

Use a calculator to fill in the table. Round to the nearest hundredth.

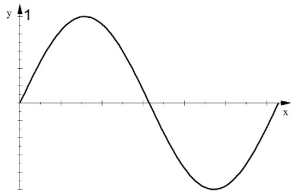
θ	0	$\frac{\pi}{4}$	$\frac{\pi}{2}$	$\frac{3\pi}{4}$	π	$\frac{5\pi}{4}$	$\frac{3\pi}{2}$	$\frac{7\pi}{4}$	2π	$\frac{9\pi}{4}$	$\frac{5\pi}{2}$	$\frac{11\pi}{4}$	3π	$\frac{13\pi}{4}$	$\frac{7\pi}{2}$	$\frac{15\pi}{4}$	4π
Sinθ	0	.71	1	.71	0	-.71	-1	-.71	0	.71	1	.71	0	-.71	-1	-.71	0

Graph the data in this table to see what the Sine Function looks like.

y = sinθ

Eq of Midline: y = 0 Amplitude = 1 Period = 2π

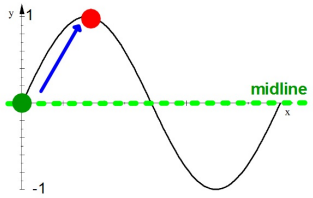
The graph of y=Sinθ



This is also referred to as a Sine Wave.

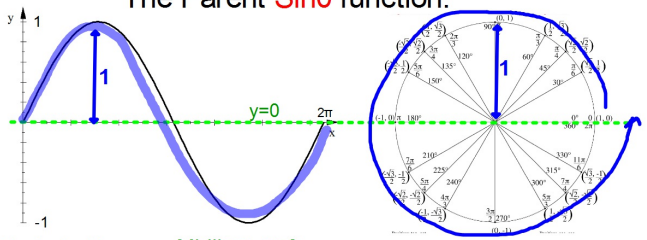
It looks like a sideways "S"

Starting point for the Parent Sine function: y = Sinθ



The Parent Sine Functions starts on the midline and goes up to a maximum.

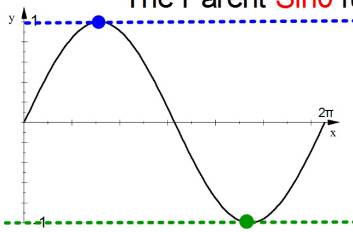
The Parent Sinθ function:

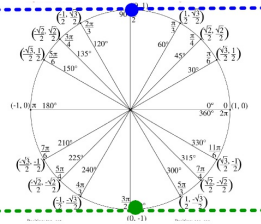


Period = 2π Midline: y=0

Amplitude = 1

The Parent Sinθ function:

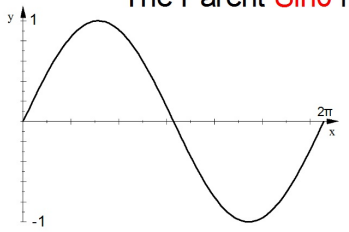


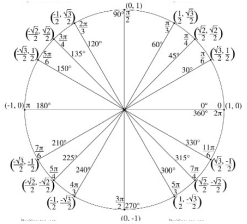


Max of 1 occurs at $\frac{\pi}{2}$

Min of -1 occurs at $\frac{3\pi}{2}$

The Parent Sinθ function:

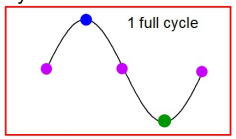


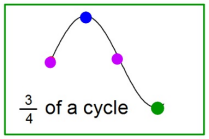


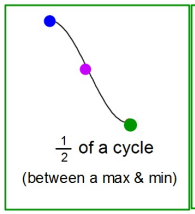
Domain: (-∞,∞)

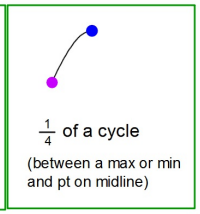
Range: [-1,1]

1 cycle of a Sine function with pts at a max, min, and on the midline.



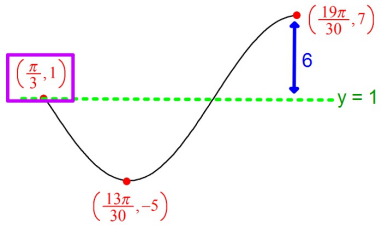






The only points that we will work with on the graph of a Sine function are points that are Maximums, Minimums, or points on the Midline.

Find the period, amplitude, and equation of the midline for this portion of a Sine graph.

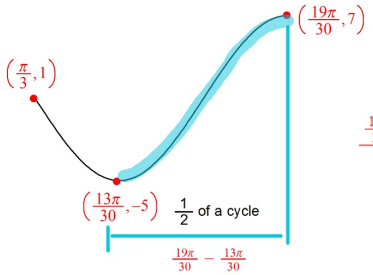


Eq of Midline: y = 1 Amplitude = 6

Period:

See next page

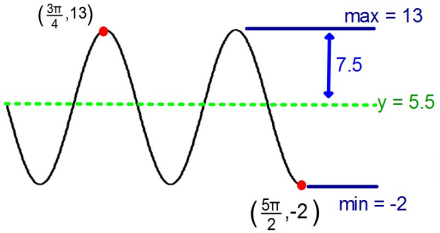
Find the period, amplitude, and equation of the midline for this portion of a Sine graph.



Period: $\frac{\text{total width}}{\text{\# cycles}}$

$$\frac{\frac{19\pi}{30} - \frac{13\pi}{30}}{\frac{1}{2}} = \frac{6\pi}{30} \cdot \frac{2}{1} = \boxed{\frac{2\pi}{5}}$$

Find the period, amplitude, and equation of the midline for this portion of a Sine graph.



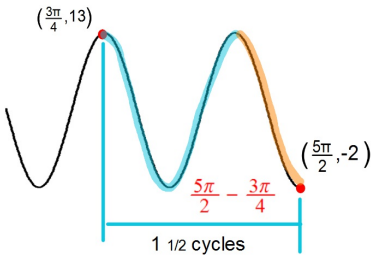
Eq of Midline: y = 5.5

$\frac{13 + -2}{2} = \frac{11}{2} = \boxed{5.5}$

Amplitude = 7.5

$\frac{13 - (-2)}{2} = \frac{15}{2} = \boxed{7.5}$

Period:
See next page.



Period:

$$\frac{\frac{5\pi}{2}-\frac{3\pi}{4}}{1\frac{1}{2}}=\frac{\frac{10\pi}{4}-\frac{3\pi}{4}}{\frac{3}{2}}$$

$$=\frac{7\pi}{4}\cdot\frac{2}{3}=\boxed{\frac{7\pi}{6}}$$

You can now finish the first few problems of Practice #25.

We'll finish the remainder of the material tomorrow.

This practice will be due on Saturday, May 9 by 10:00pm