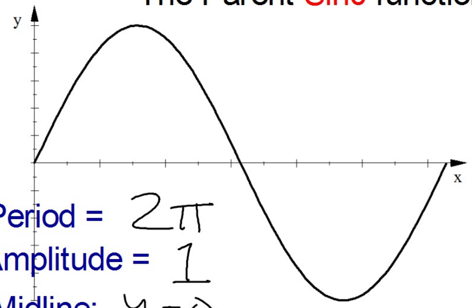
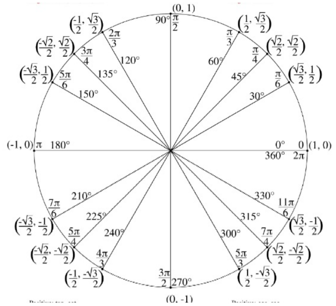
The Parent Sinθ function:





Period = 2π

Amplitude = 1

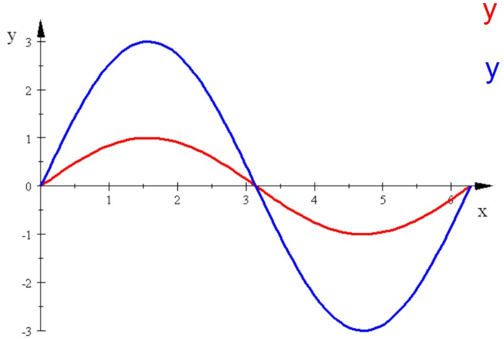
Midline: $y=0$

Max= 1 at $\theta=\frac{\pi}{2}$ x-int at $\theta=0,\pi,2\pi$ Domain: $(-\infty,\infty)$

Min= -1 at $\theta=\frac{3\pi}{2}$ y-int when $\theta=0$ Range: $[-1,1]$

Graph of y=sinx Exploration

Results and conclusions on the following pages

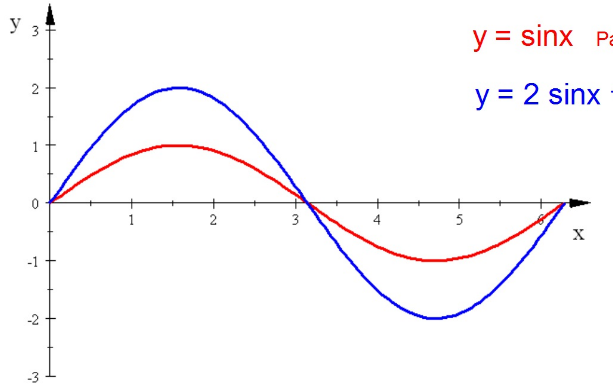


y = sinx Parent Function

y = 3 sinx → Vertical Stretch factor of 3

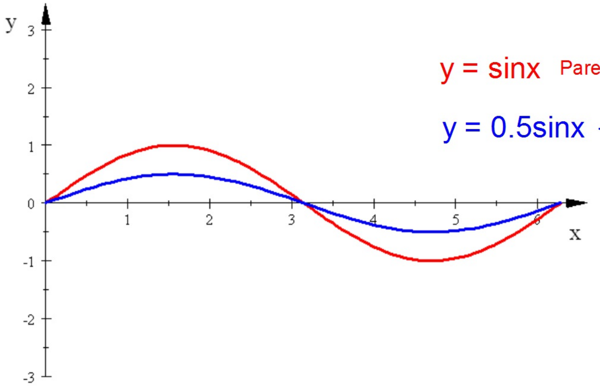
or

3 times taller



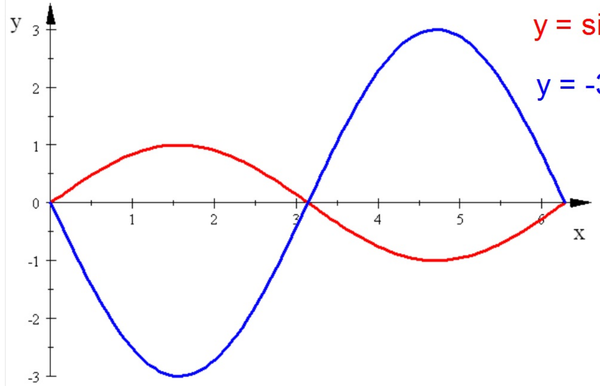
y = sinx Parent Function

y = 2 sinx → Twice as tall



$y = \sin x$ Parent Function

$y = 0.5\sin x$ → $\frac{1}{2}$ as tall



$y = \sin x$ Parent Function

$y = -3\sin x$ → 3 times taller and upside down

$y = a\sin x$

$|a|$ = Amplitude (Vertical Stretch Factor)

Can you have a negative Amplitude?

No, since amplitude is a distance, it can't be negative.

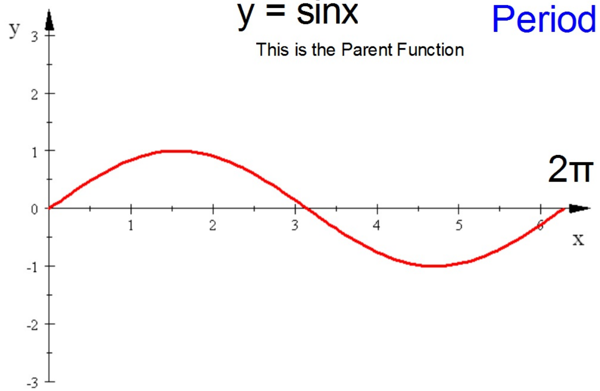
If $a<0$ then there is an x-axis reflection.

Upside down

$y = \sin x$

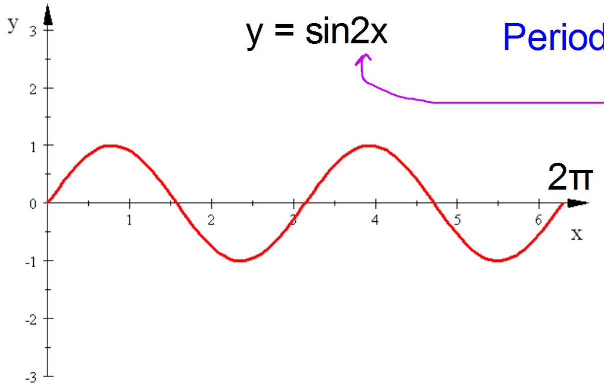
This is the Parent Function

Period = 2π



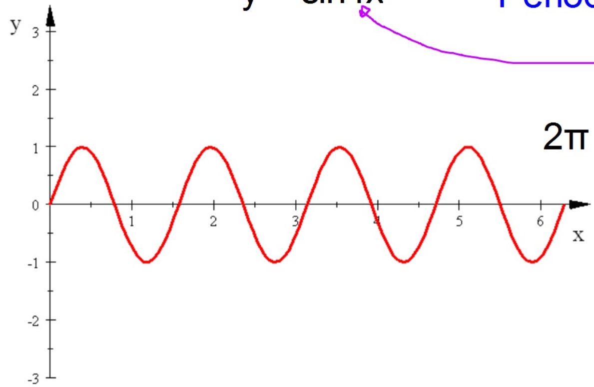
y = sin2x

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



y = sin4x

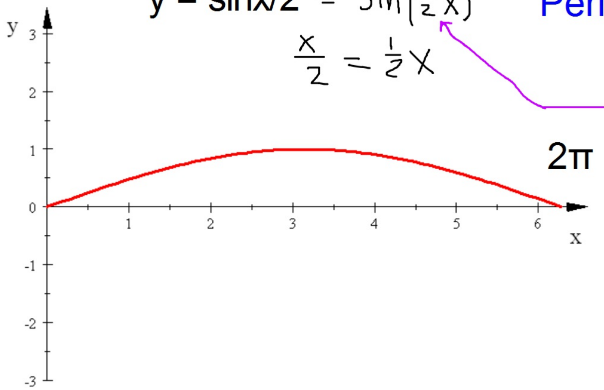
Period = $\frac{2\pi}{4} = \frac{\pi}{2}$



y = sinx/2 $= \sin\left(\frac{1}{2}x\right)$

$\frac{x}{2} = \frac{1}{2}x$

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



y = sinbx

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

Find the amplitude and period for each Sine Function:

1. $y = 7\sin 5x$

Amplitude= 7

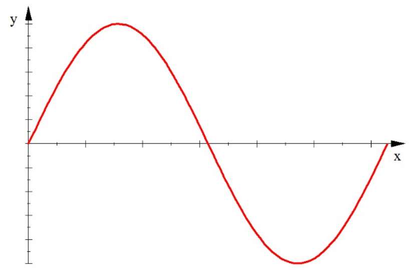
Period= $\frac{2\pi}{5}$

2. $y = -4\sin\frac{x}{3}$

Amplitude= 4

Period= $\frac{2\pi}{\frac{1}{3}} = 6\pi$

The Parent Function: y = Sinx



Period= 2π

Amplitude= 1

Eq of Midline: $y = 0$

y = asinbx

$|a|$= Amplitude

When a<0 there is an x-axis reflection (upside down)

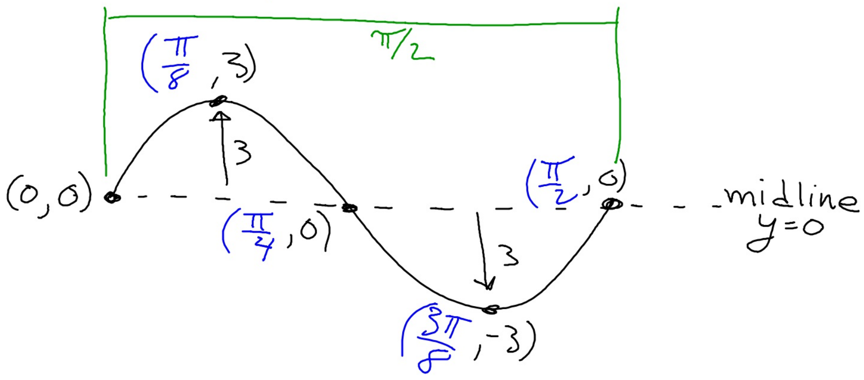
b: ⟶ Period = $\frac{2\pi}{b}$

Sketch one period of the graph of

y=3sin4x   Label the coordinates of all x-intercepts, minimums, and maximums.

Amplitude = 3

period = $\frac{2\pi}{4} = \frac{\pi}{2}$



Sketch one period of the graph of

$y = -5\sin\left(\frac{x}{2}\right)$ Amplitude = 5 upside down

period = $\frac{2\pi}{1/2} = 4\pi$

Label the coordinates of all x-intercepts, minimums, and maximums.