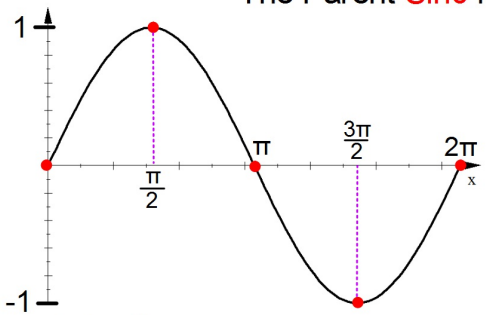
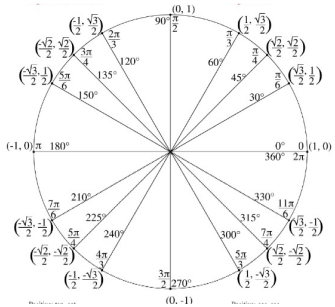
The Parent Sinθ function:





Period = 2π

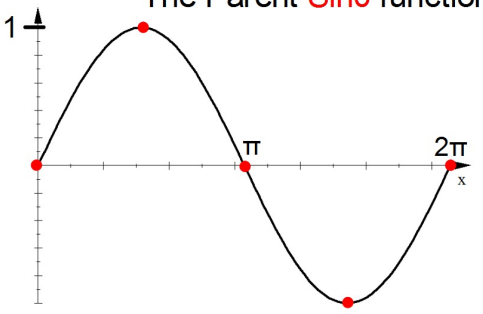
Amplitude = 1

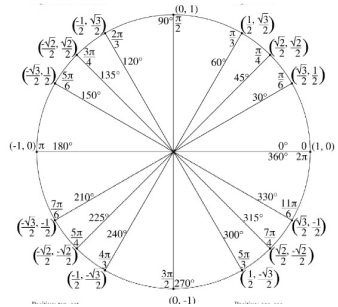
Eq of Midline: y = 0

Max = 1 when $x = \frac{\pi}{2}$

Min = -1 when $x = \frac{3\pi}{2}$

The Parent Sinθ function:





x-int at
0, π, 2π

y-int
0

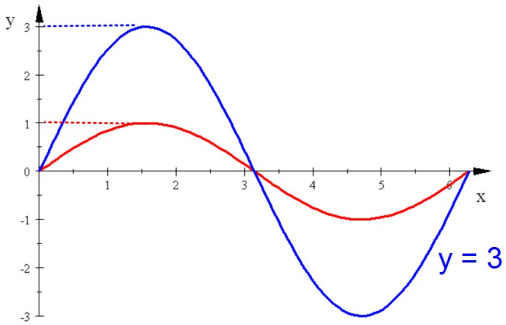
Domain:
(-∞,∞)

Range:
[-1,1]

Graph of y = asinbx Exploration

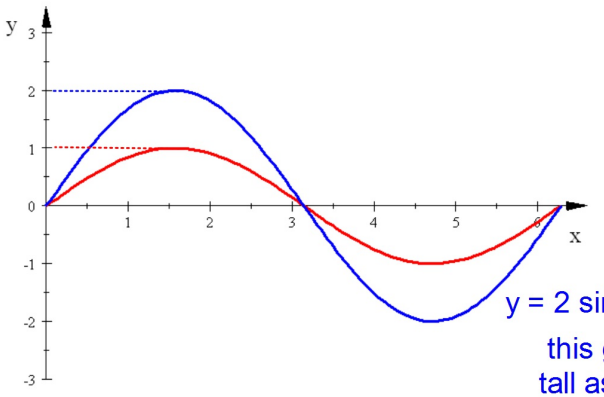
Part One

Parent Function: y = sinx



this graph is three times taller than the Parent Function

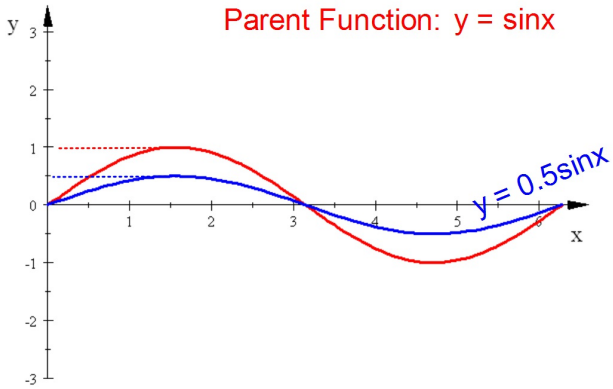
Parent Function: y = sinx



y = 2 sinx

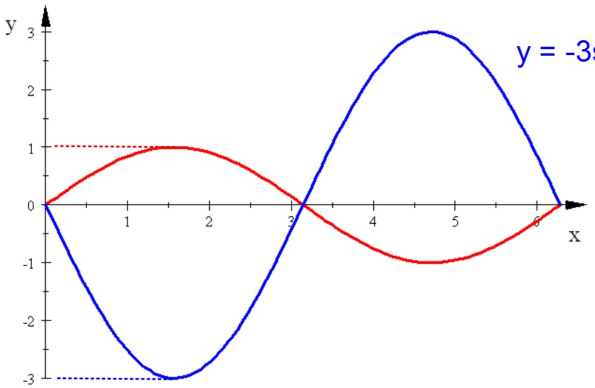
this graph is twice as tall as the Parent Function

Parent Function: y = sinx



this graph is half as tall as the Parent Function

Parent Function: y = sinx



y = -3sinx

this graph is three times taller than the Parent Function and Upside Down.

y = asinx

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

Now Do Part 2 of the Exploration.

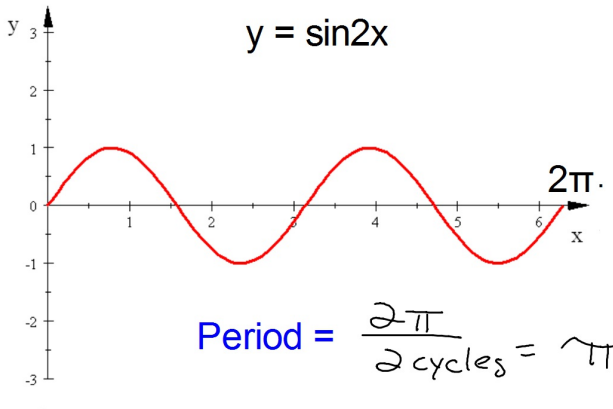
Remember:

$$\text{Period} = \frac{\text{distance between two points}}{\text{\# cycles between those two points}}$$

1. y= Sinx Period = 2π

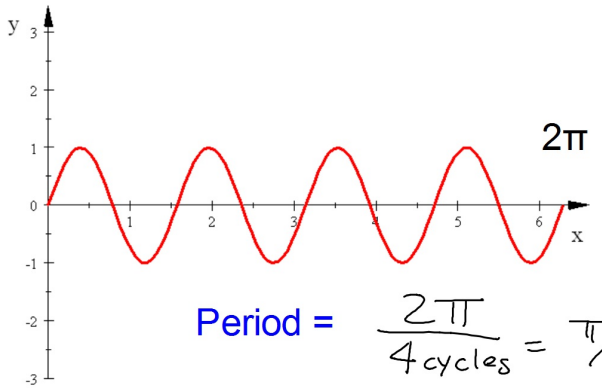
this is the parent Sinx

y = sin2x



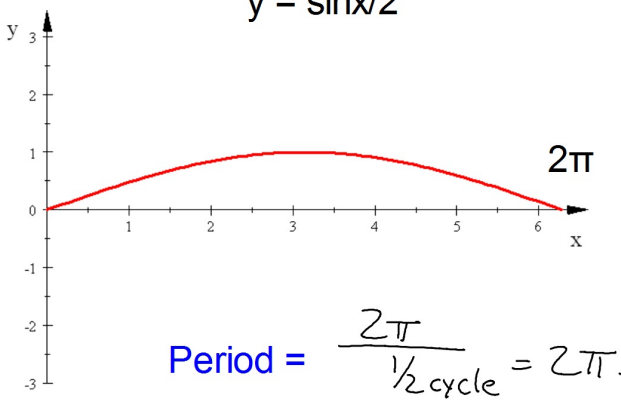
Period = $\frac{2\pi}{2 \text{ cycles}} = \pi$

y = Sin4x



Period = $\frac{2\pi}{4 \text{ cycles}} = \pi/2$

y = sinx/2



Period = $\frac{2\pi}{\frac{1}{2}\text{cycle}} = 2\pi \cdot \frac{2}{1} = 4\pi$

sinbx	Period
$\sin x$	2π
$\sin 2x$	$\frac{2\pi}{2} = \pi$
$\sin 4x$	$\frac{2\pi}{4} = \frac{\pi}{2}$
$\sin \frac{x}{2}$ $= \sin(\frac{1}{2}x)$	$\frac{2\pi}{\frac{1}{2}} = 4\pi$

y = sinbx

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

Find the amplitude and period for each Sine Function:

1. $y = 7\sin 5x$ (a = 7, b = 5)

Amplitude= a = 7

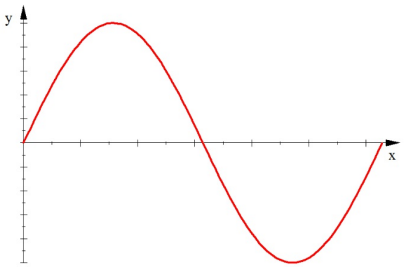
Period= $\frac{2\pi}{5}$

2. $y = -4\sin\frac{x}{3}$ (|a| = 4, b = 1/3)

Amplitude= a = 4

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

The Parent Function: y = Sinx



Period= 2π

Amplitude= 1

Eq of Midline: y = 0

$y = a\sin bx$

a = Amplitude

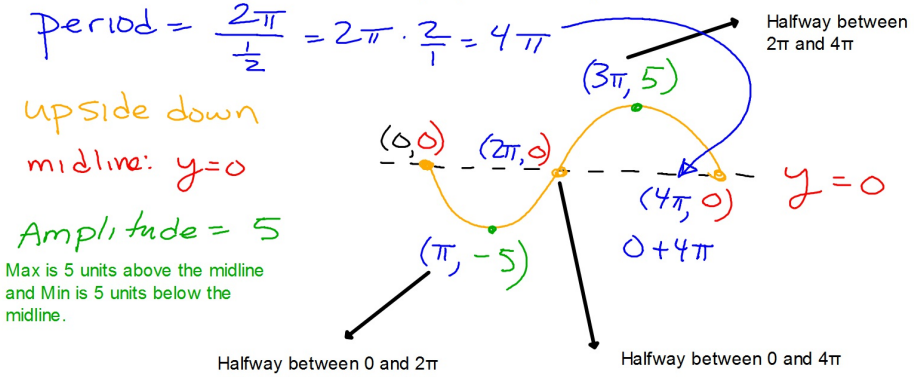
a<0 is an x-axis reflection (upside down)

b: ⟶ Period = $\frac{2\pi}{b}$

Sketch one period of the graph of

$y = -5\sin\left(\frac{x}{2}\right) = -5\sin\left(\frac{1}{2}x\right)$

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



Sketch one period of the graph of

y=3sin4x

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