

Graphing Trigonometric Functions

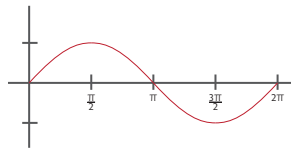
Parent Functions

Trig Functions

Sine (sin)

Amplitude: 1

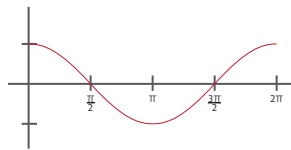
Period: 2π



Cosine (cos)

Amplitude: 1

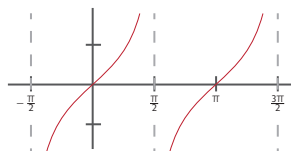
Period: 2π



Tangent (tan)

Amplitude: N/A

Period: π



Cosecant (csc)

Amplitude: N/A

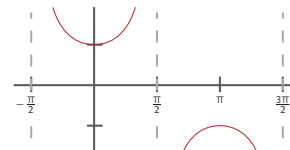
Period: 2π



Secant (sec)

Amplitude: N/A

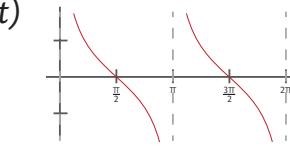
Period: 2π



Cotangent (cot)

Amplitude: N/A

Period: π



Transforming the Parent Functions

This section uses the sine function as an example; all the other functions behave similarly.

General form: $y = a \cdot \sin[b(x - h)] + k$

New amplitude: a (sine and cosine only)

New period: (parent's period) / b

x-offset: h

y-offset: k

e.g., $y = 3\sin[4(x - \pi)] + 4$

New amplitude: 3

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

x-offset: π rightward

y-offset: 4 upward

Even-Odd

When graphing trig functions, make use of the fact that sine and tangent are odd functions and cosine is an even function.

$$y = \sin(-x + 2) \quad \rightarrow \quad y = \sin(-(x - 2)) \quad \rightarrow \quad y = -\sin(x - 2)$$

$$y = \tan(-x + 2) \quad \rightarrow \quad y = \tan(-(x - 2)) \quad \rightarrow \quad y = -\tan(x - 2)$$

$$y = \cos(-x + 2) \quad \rightarrow \quad y = \cos(-(x - 2)) \quad \rightarrow \quad y = \cos(x - 2)$$