

## Graphing Trig Functions

### SINE & COSINE:

$$y = A \sin (Bx - C) + D \quad \text{or} \quad y = A \cos (Bx - C) + D$$

Amplitude:  $|A|$

Period:  $\frac{2\pi}{|B|}$  or  $\frac{360^\circ}{|B|}$

Frequency:  $\frac{|B|}{2\pi}$  or  $\frac{|B|}{360^\circ}$

Phase shift:  $\frac{C}{|B|}$

Horizontal Shift: if  $C > 0$ , then shifts  $C$  units to right (NOTE: the original equation would be  $Bx - C$ )  
if  $C < 0$ , then shifts  $C$  units to left (NOTE: the original equation would be  $Bx + C$ )

Vertical Shift: if  $D > 0$ , then shifts  $D$  units up  
if  $D < 0$ , then shifts  $D$  units down

### TANGENT:

$$y = A \tan (Bx - C) + D$$

Vertical asymptote:  $x = \frac{\pi}{2|B|}$  or  $x = \frac{180^\circ}{2|B|}$

Period:  $\frac{\pi}{|B|}$  or  $\frac{180^\circ}{|B|}$

Phase shift:  $\frac{C}{|B|}$

Horizontal Shift: if  $C > 0$ , then shifts  $C$  units to right (NOTE: the original equation would be  $Bx - C$ )  
if  $C < 0$ , then shifts  $C$  units to left (NOTE: the original equation would be  $Bx + C$ )

Vertical Shift: if  $D > 0$ , then shifts  $D$  units up  
if  $D < 0$ , then shifts  $D$  units down