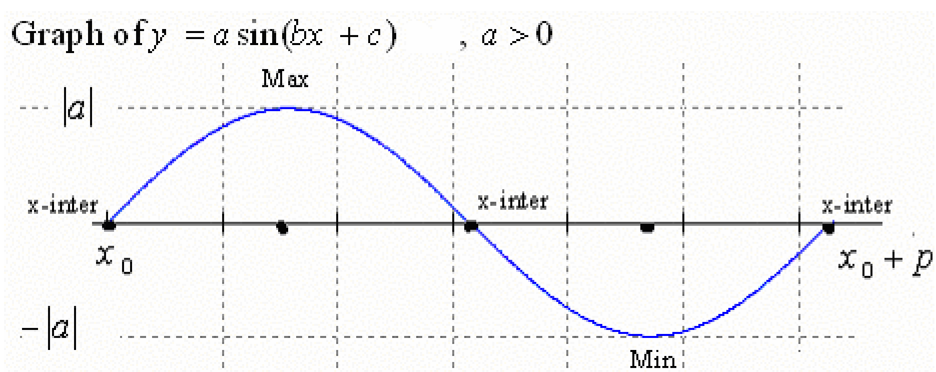
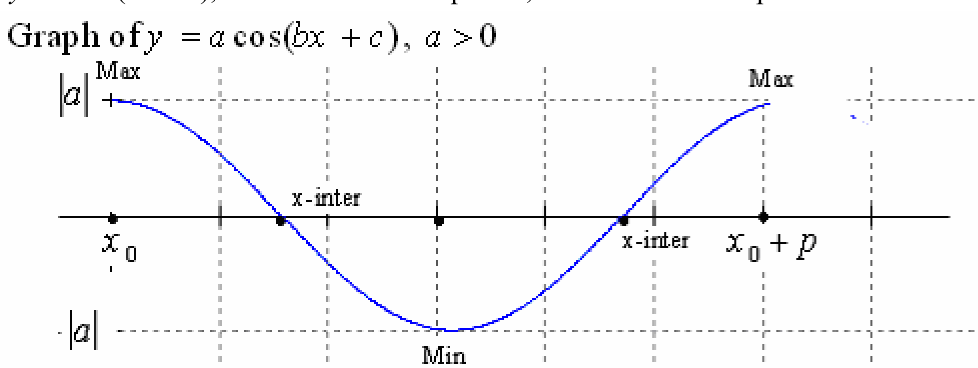
Part I: Properties of the Graphs of the Sin and Cos Functions:

Property	$y = a\sin(bx + c) + d$, $y = a\cos(bx + c) + d$
Domain	$(-\infty, \infty)$
Amplitude	$\lvert a\rvert$ or $\frac{\text{Max} - \text{Min}}{2}$
Period	$p = \frac{2\pi}{b}$
Range	$\left[-\lvert a\rvert + d \ , \ \lvert a\rvert + d \right]$
Phase Shift	$x = \frac{-c}{b}$ or $\begin{cases} \frac{c}{b} & \text{units to the right if } \frac{-c}{b} \text{ is +ve} \\ \frac{c}{b} & \text{units to the left if } \frac{-c}{b} \text{ is } -\text{ve} \end{cases}$
One period of the Graph Starts at	$x_0 = \frac{-c}{b}$
One period of the Graph Ends at	$x_e = \frac{-c}{b} + \text{period}$
One period is divided into 4-equal parts	Using the midpoint formula $x_{\frac{1}{2}} = \frac{x_1 + x_2}{2}$ for two coordinates x_1 and x_2

Graph of $y = a\sin(bx + c) + d$, $a > 0$ over one full period, d results in shift up if d is +ve/ down if d is -ve



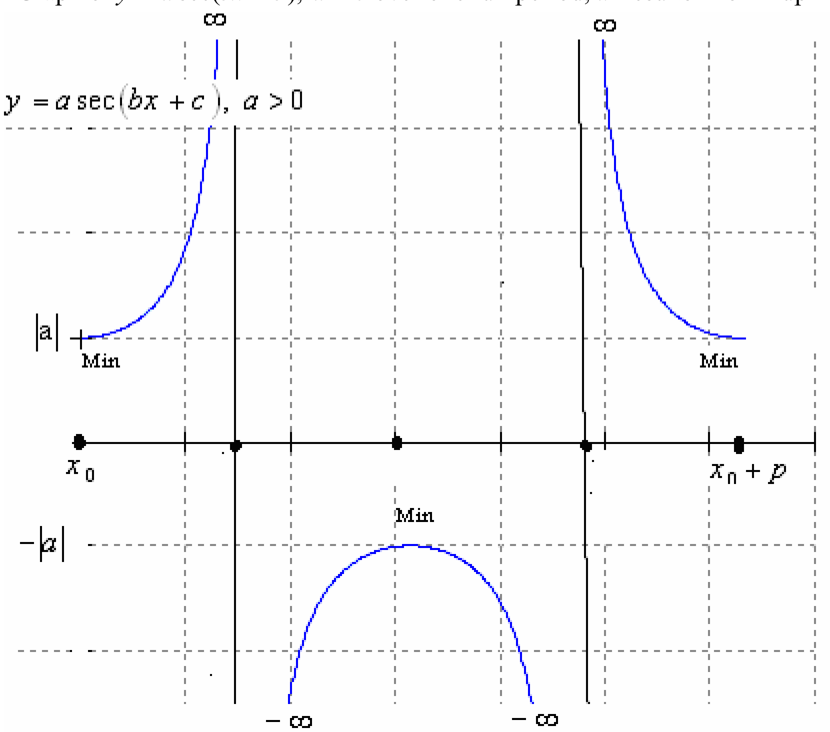
Graph of $y = a\cos(bx + c)$, $a > 0$ over one full period, d results in shift up if d is +ve/ down if d is -ve



Part II: Properties of the Graphs of the Sec and Csc Functions:

Property	$y = aCsc\left(bx + c\right) + d$	$y = aSec\left(bx + c\right) + d$,
Domain	$\left(-\infty,\infty\right) - \{x \mid bx + c = n\pi, n \in \text{integers}\}$	$\left(-\infty,\infty\right) - \{x \mid bx + c = \frac{\left(2n+1\right)\pi}{2}, n \in \text{integers}\}$
Vertical Asymptotes	$bx + c = n\pi,\ n \in$ integers	$bx + c = \frac{\left(2n+1\right)\pi}{2},\ n \in$ integers
Amplitude	NO	NO
Period	$p = \frac{2\pi}{b}$	$p = \frac{2\pi}{b}$
Range	$\left(-\infty,\ -\lvert a\rvert + d\ \right] \cup \left[\ \lvert a\rvert\ + d\ ,\infty\right)$	$\left(-\infty,\ -\lvert a\rvert + d\ \right] \cup \left[\ \lvert a\rvert\ + d\ ,\infty\right)$
Phase Shift	$x = \frac{-c}{b}$ or $\begin{cases} \frac{c}{b} & \text{units to the right if } \frac{-c}{b} \text{ is +ve} \\ \frac{c}{b} & \text{units to the left if } \frac{-c}{b} \text{ is } -\text{ve} \end{cases}$	$x = \frac{-c}{b}$ or $\begin{cases} \frac{c}{b} & \text{units to the right if } \frac{-c}{b} \text{ is +ve} \\ \frac{c}{b} & \text{units to the left if } \frac{-c}{b} \text{ is } -\text{ve} \end{cases}$
One period of the Graph Starts at	$x_0 = \frac{-c}{b}$	$x_0 = \frac{-c}{b}$
One period of the Graph Ends at	$x_e = \frac{-c}{b} + \text{period}$	$x_e = \frac{-c}{b} + \text{period}$
One period is divided into 4-equal parts	Using the midpoint formula $x_{\frac{1}{2}} = \frac{x_1 + x_2}{2}$ for two coordinates x_1 and x_2	Using the midpoint formula $x_{\frac{1}{2}} = \frac{x_1 + x_2}{2}$ for two coordinates x_1 and x_2

Graph of $y = a\sec(bx + c)$, $a > 0$ over one full period, d results in shift up if d is +ve/ down if d is -ve



Graph of $y = aCsc(bx + c)$, $a > 0$ over one full period, d results in shift up if d is +ve/ down if d is -ve