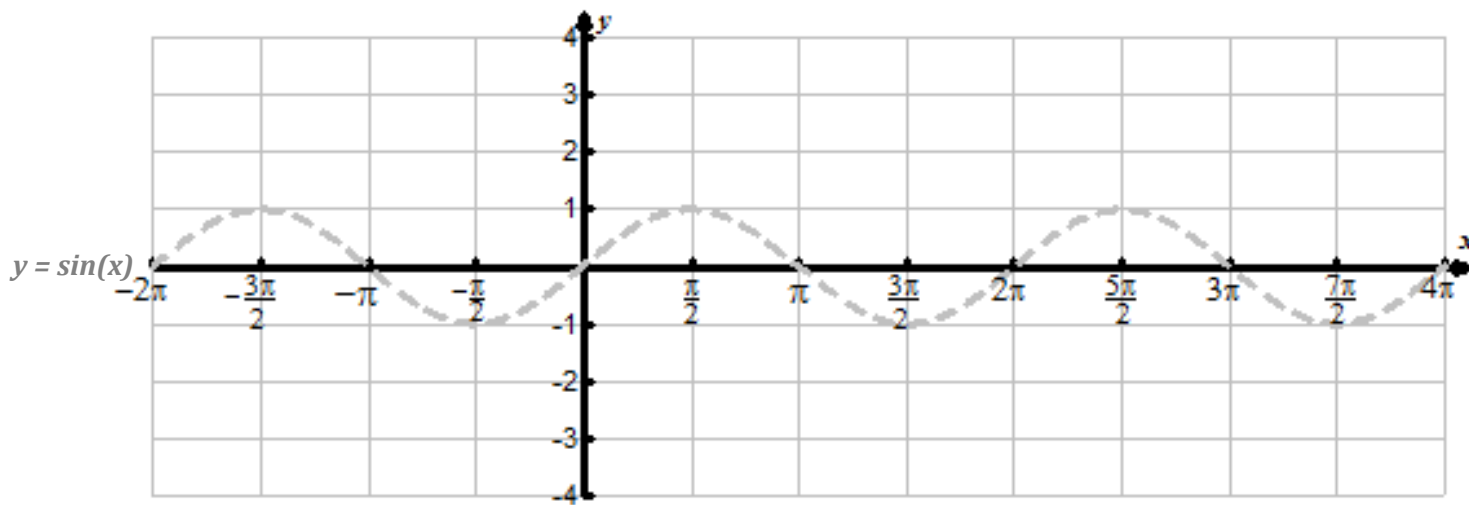


Recall, $\sin(\theta) = \frac{\text{opp}}{\text{hyp}}$, $\csc(\theta) = \frac{\text{hyp}}{\text{opp}}$, $\cos(\theta) = \frac{\text{adj}}{\text{hyp}}$, and $\sec(\theta) = \frac{\text{hyp}}{\text{adj}}$. Use this to show:

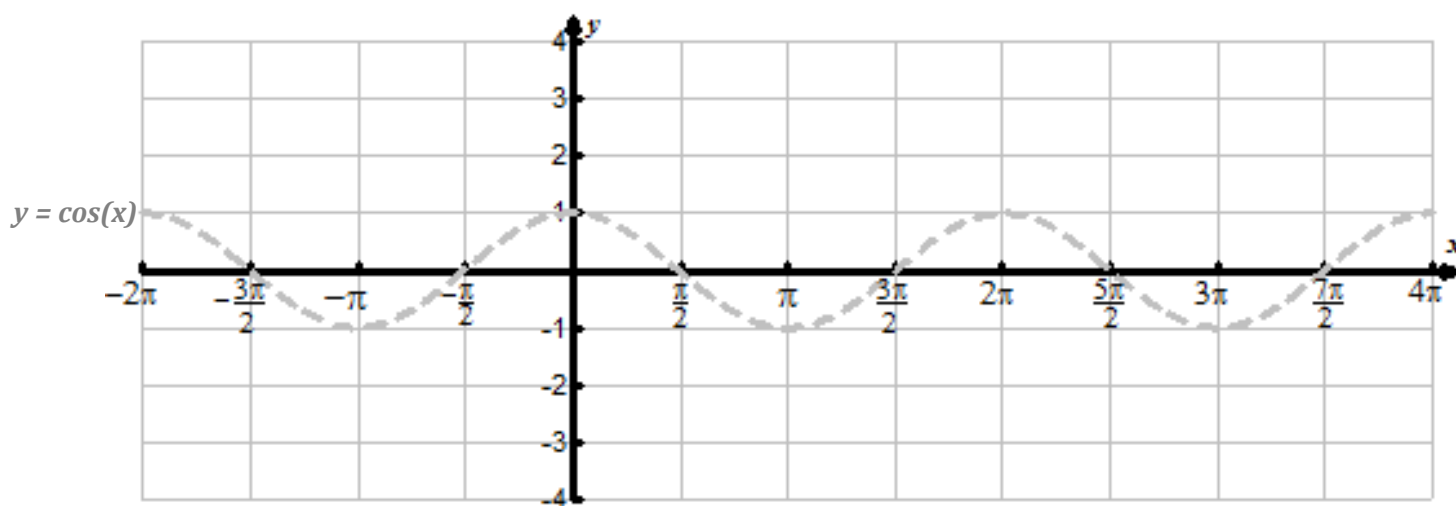
$$\frac{1}{\sin(\theta)} =$$

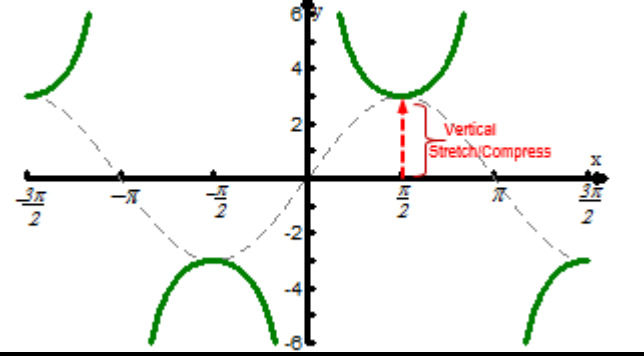
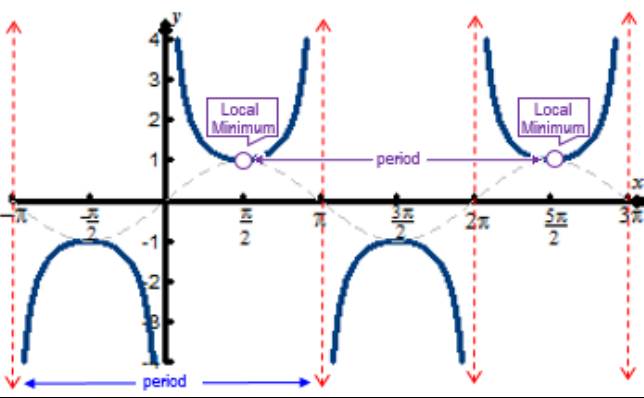
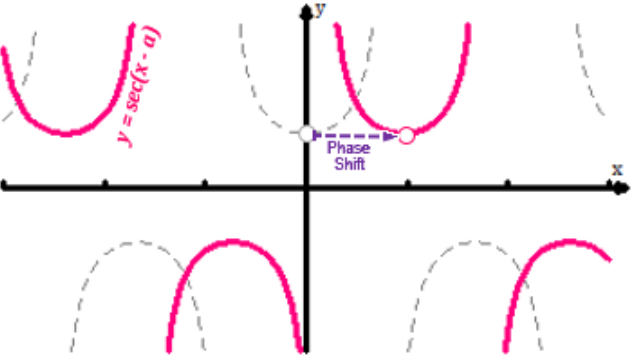
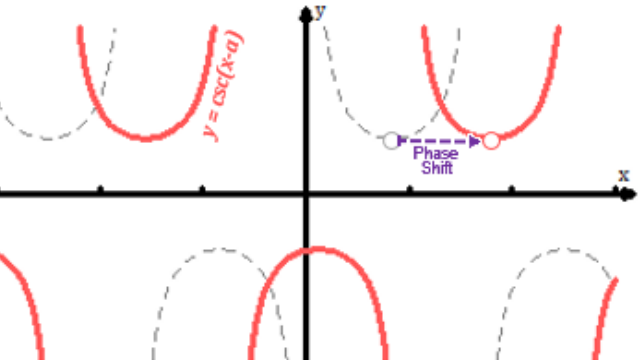
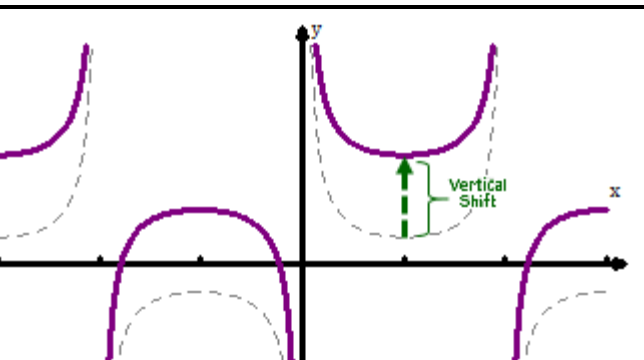
$$\frac{1}{\cos(\theta)} =$$

Use the above relationship to help you graph $y = \csc(x)$.



Use the above relationship to help you graph $y = \sec(x)$.



Parts of a Tangent and Cotangent Graph	Visual
Vertical Stretch/Compress: Secant and Cosecant graphs have a vertical stretch that would be equivalent to the amplitude of their reciprocal trig function. Vertical Factor = $\frac{(\text{Local Max } Y) - (\text{Local Min } Y)}{2}$	
Period: The period of the graph is the horizontal distance of one complete cycle. Period = $(\text{Local Min } X) - (\text{Previous Local Min } X)$ Period = $(\text{Local Max } X) - (\text{Previous Local Max } X)$ Period = $(\text{Asymptote } X) - (\text{2nd Previous Asymptote } X)$	
Phase Shift (Secant): The amount the graph is shifted right/ left Secant Phase Shift = $\text{Local Min } X$	
Phase Shift (Cosecant): The amount the graph is shifted right/ left Cosecant Phase Shift = $\frac{\text{Local Min } X + \text{Next Local Max } X}{2}$	
Vertical Shift: The amount the graph is shifted up/down Vertical Shift = $\frac{\text{Local Max } Y + \text{Local Min } Y}{2}$	

$$y = a \cdot \sec(b(x - c)) + d$$

$$y = a \cdot \csc(b(x - c)) + d$$

**a = Vertical
Stretch/Compress**

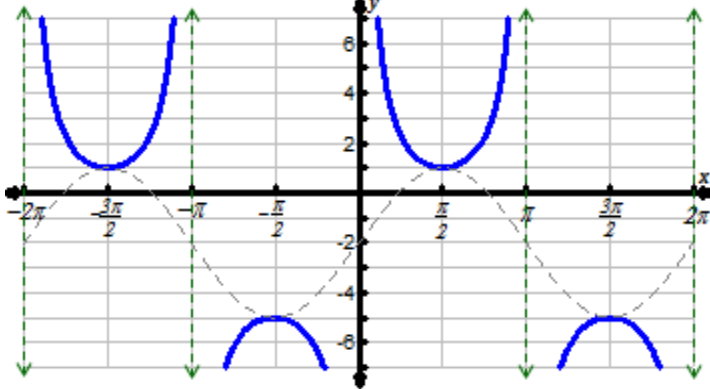
**c = Phase
Shift**

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

**d = Vertical
Shift**

1. Find the parameters of each SECANT/COSECANT graph and determine a possible equation.

a.

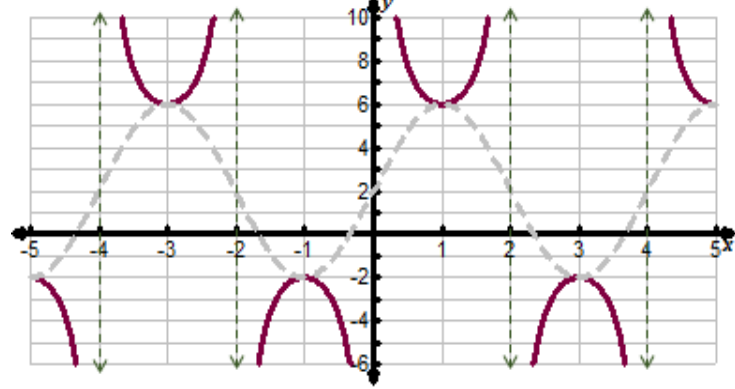


Vertical : Period: Phase: Vertical:
Stretch/Compress Shift Shift

Possible
Equation:

(Using Cosecant)

b.

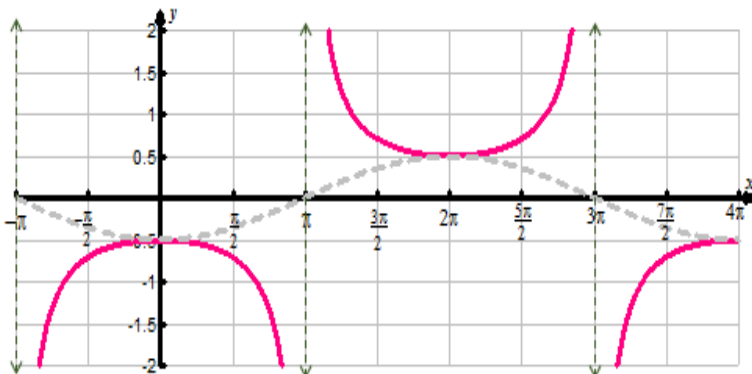


Vertical : Period: Phase: Vertical:
Stretch/Compress Shift Shift

Possible
Equation:

(Using Cosecant)

c.

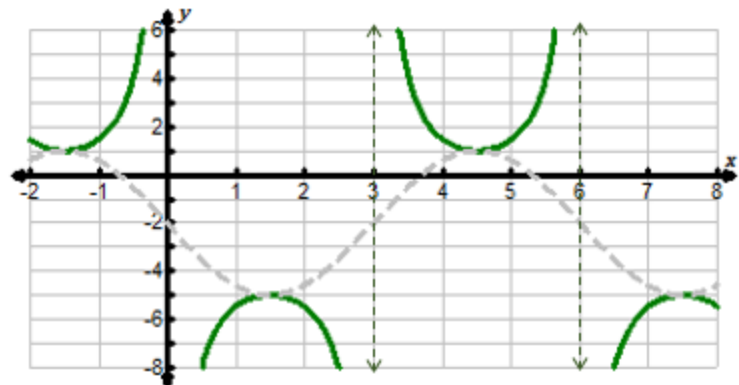


Vertical : Period: Phase: Vertical:
Stretch/Compress Shift Shift

Possible
Equation:

(Using Cosecant)

d.

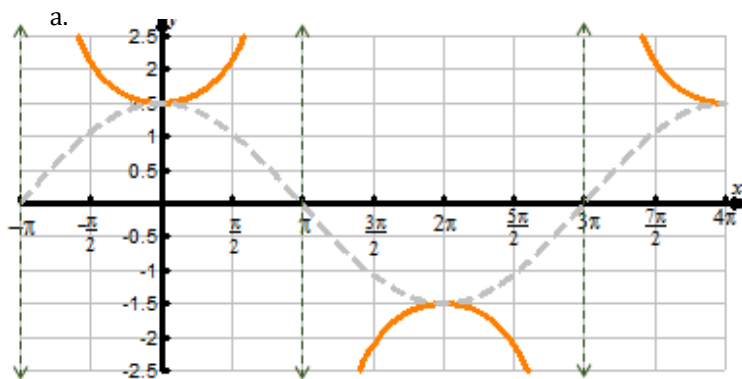


Vertical : Period: Phase: Vertical:
Stretch/Compress Shift Shift

Possible
Equation:

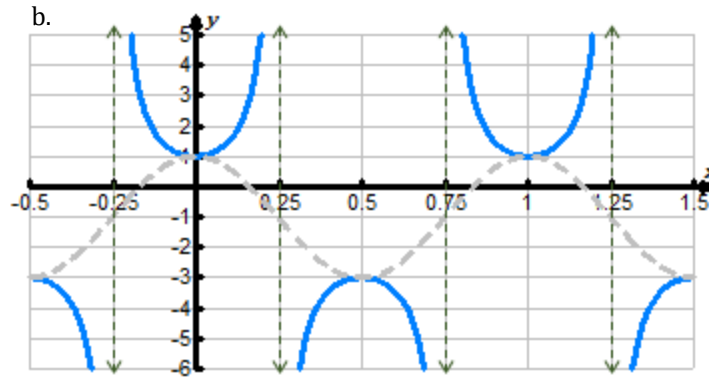
(Using Cosecant)

2. Find the parameters of each **SECANT/COSECANT** graph and determine a possible equation.



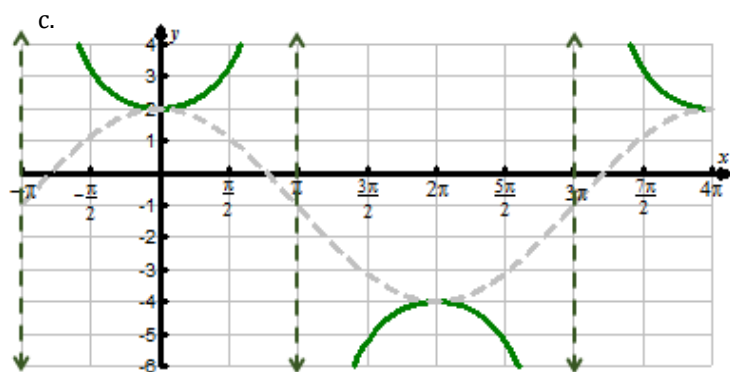
Vertical : Period: Phase: Vertical:
Stretch/Compress Shift Shift

Possible
Equation:
(Using Cosecant)



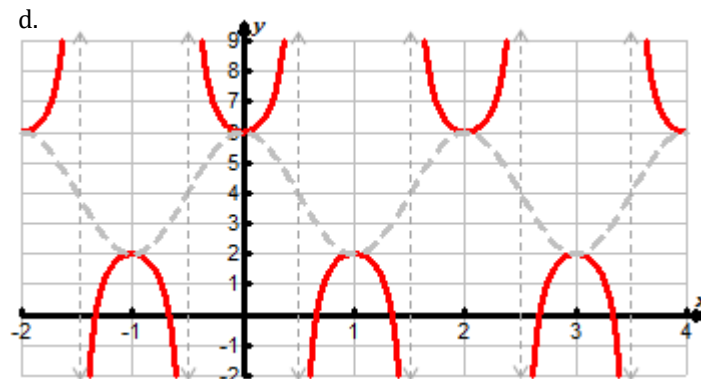
Vertical : Period: Phase: Vertical:
Stretch/Compress Shift Shift

Possible
Equation:
(Using Secant)



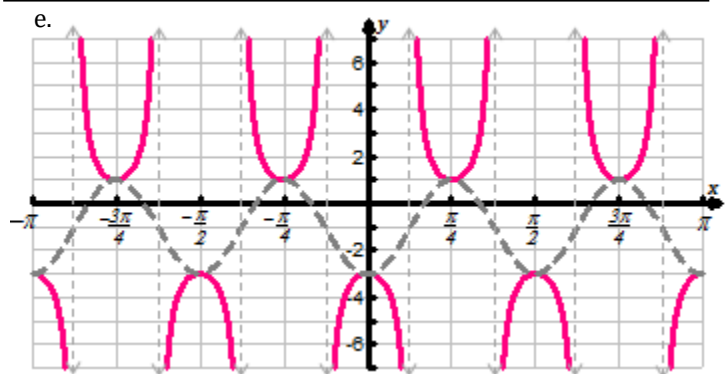
Vertical : Period: Phase: Vertical:
Stretch/Compress Shift Shift

Possible
Equation:
(Using Secant)



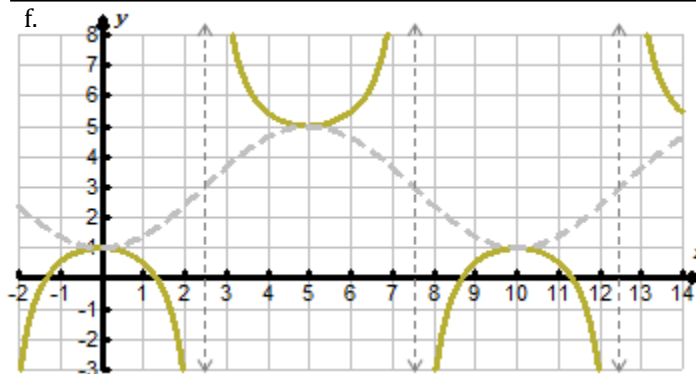
Vertical : Period: Phase: Vertical:
Stretch/Compress Shift Shift

Possible
Equation:
(Using Secant)



Vertical : Period: Phase: Vertical:
Stretch/Compress Shift Shift

Possible
Equation:
(Using Secant)

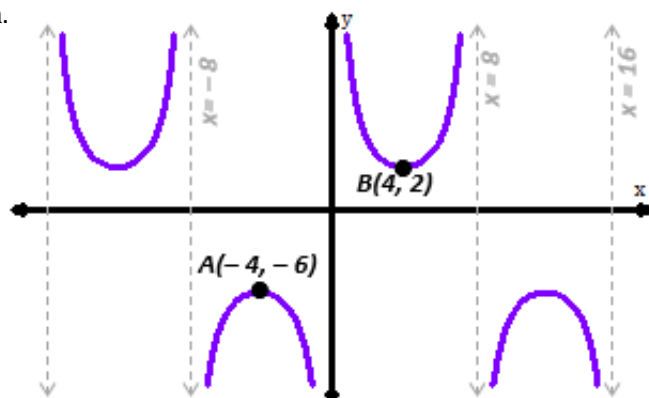


Vertical : Period: Phase: Vertical:
Stretch/Compress Shift Shift

Possible
Equation:
(Using Secant)

3. Find the parameters of each **SECANT/COSECANT** graph and determine a possible equation.

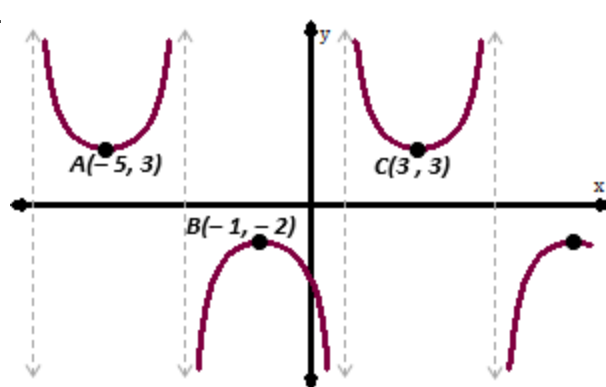
a.



Vertical : Period: Phase: Vertical:
Stretch/Compress Shift Shift

Possible
Equation:
(Using Secant)

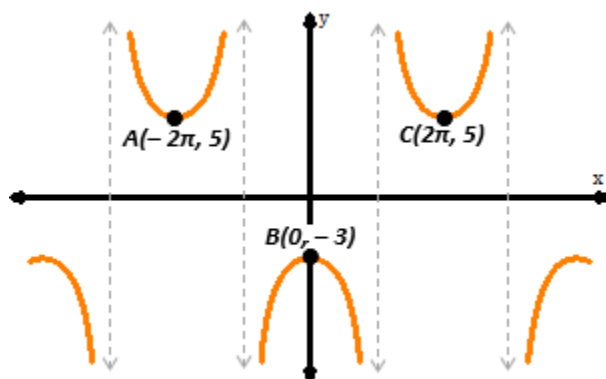
b.



Vertical : Period: Phase: Vertical:
Stretch/Compress Shift Shift

Possible
Equation:
(Using Secant)

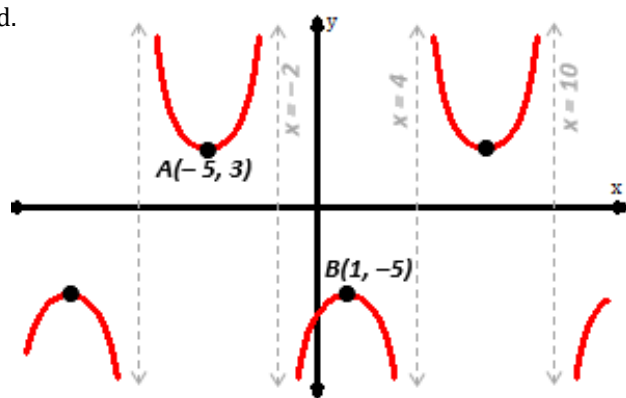
c.



Vertical : Period: Phase: Vertical:
Stretch/Compress Shift Shift

Possible
Equation:
(Using Cosecant)

d.



Vertical : Period: Phase: Vertical:
Stretch/Compress Shift Shift

Possible
Equation:
(Using Cosecant)

4. Find the requested **SECANT/COSECANT** parameters based on the following equations.

a.

$$y = 3\sec(2x - 6) + 1$$

Vertical =
Stretch/Compress

Period =

Phase =
Shift

Vertical =
Shift

b.

$$y = 0.5\csc\left(\frac{2\pi}{3}(x+1)\right) - 3$$

Vertical =
Stretch/Compress

Period =

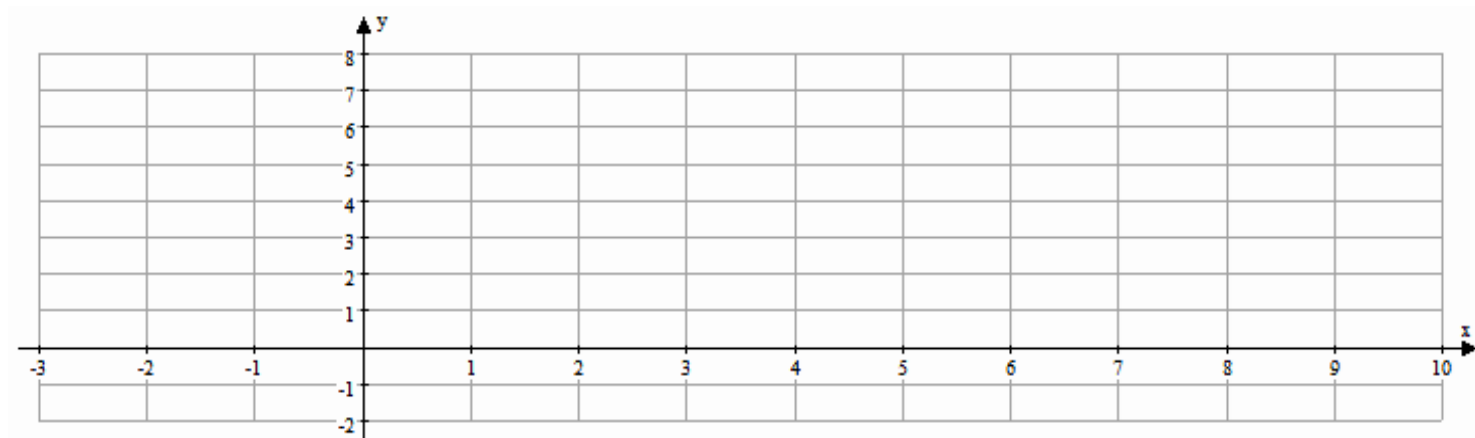
Phase =
Shift

Vertical =
Shift

5. Graph the following equation.

a.

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



b. $y = 2 \sec\left(2\left(x - \frac{\pi}{2}\right)\right) + 6$

