

Pre-Calculus Worksheet
Cosecant and secant

Name: Key
Per: _____

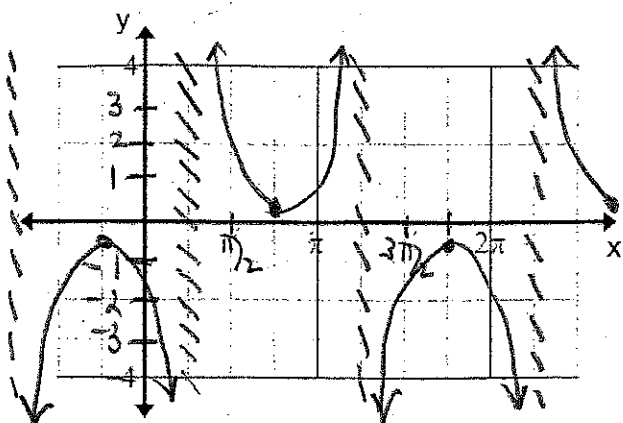
I. Fill in the chart for each function. DO NOT GRAPH. And FACTOR first when needed!

<p>1. $y = -5\csc(2x) + 2$</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Amplitude: <u>5</u></td></tr> <tr><td>Flip? <u>across x-axis</u></td></tr> <tr><td>Vertical Shift: <u>up 2</u></td></tr> <tr><td>Period: $\frac{2\pi}{2} = \pi$</td></tr> <tr><td>Phase Shift: <u>None</u></td></tr> </table>	Amplitude: <u>5</u>	Flip? <u>across x-axis</u>	Vertical Shift: <u>up 2</u>	Period: $\frac{2\pi}{2} = \pi$	Phase Shift: <u>None</u>	<p>2. $y = \frac{1}{2}\sec\left(3x - \frac{\pi}{2}\right) - 5$</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Amplitude: $\frac{1}{2}$</td></tr> <tr><td>Flip? <u>None</u></td></tr> <tr><td>Vertical Shift: <u>down 5</u></td></tr> <tr><td>Period: $\frac{2\pi}{3}$</td></tr> <tr><td>Phase Shift: <u>right $\pi/6$</u></td></tr> </table> <p style="text-align: center;">$\frac{1}{2}\sec\left[3\left(x - \frac{\pi}{6}\right)\right] - 5$</p>	Amplitude: $\frac{1}{2}$	Flip? <u>None</u>	Vertical Shift: <u>down 5</u>	Period: $\frac{2\pi}{3}$	Phase Shift: <u>right $\pi/6$</u>	<p>3. $y = -\frac{1}{5}\csc(4x + \pi)$</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>Amplitude: $\frac{1}{5}$</td></tr> <tr><td>Flip? <u>across x-axis</u></td></tr> <tr><td>Vertical Shift: <u>None</u></td></tr> <tr><td>Period: $2\pi/4 = \pi/2$</td></tr> <tr><td>Phase Shift: <u>left $\pi/4$</u></td></tr> </table> <p style="text-align: center;">$-\frac{1}{5}\csc\left[4\left(x + \frac{\pi}{4}\right)\right]$</p>	Amplitude: $\frac{1}{5}$	Flip? <u>across x-axis</u>	Vertical Shift: <u>None</u>	Period: $2\pi/4 = \pi/2$	Phase Shift: <u>left $\pi/4$</u>
Amplitude: <u>5</u>																	
Flip? <u>across x-axis</u>																	
Vertical Shift: <u>up 2</u>																	
Period: $\frac{2\pi}{2} = \pi$																	
Phase Shift: <u>None</u>																	
Amplitude: $\frac{1}{2}$																	
Flip? <u>None</u>																	
Vertical Shift: <u>down 5</u>																	
Period: $\frac{2\pi}{3}$																	
Phase Shift: <u>right $\pi/6$</u>																	
Amplitude: $\frac{1}{5}$																	
Flip? <u>across x-axis</u>																	
Vertical Shift: <u>None</u>																	
Period: $2\pi/4 = \pi/2$																	
Phase Shift: <u>left $\pi/4$</u>																	

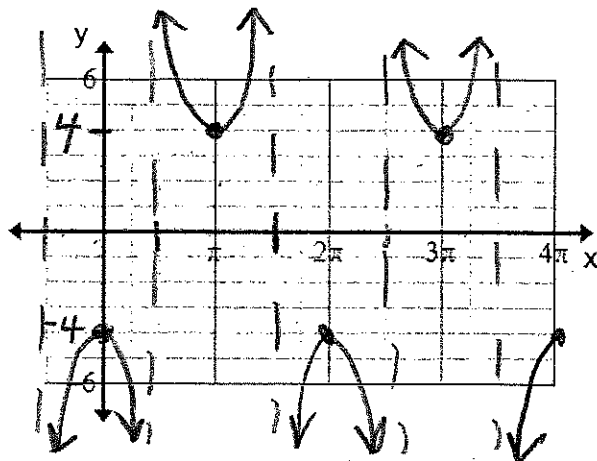
II. Graph each function, over one period, showing the vertical asymptotes.

<p>4. $y = \csc\left(\frac{1}{4}x\right)$ NP = $\frac{2\pi}{\frac{1}{4}} = 8\pi$</p>	<p>5. $y = \sec(2x) + 3$ NP = $\frac{2\pi}{2} = \pi$ VS = $\uparrow 3$</p>
<p>6. $y = -\sec x - 2$ reflect x-axis VS = $\downarrow 2$</p>	<p>7. $y = 3\csc x + 1$ A = 3 VS = $\uparrow 1$</p>

8. $y = \frac{1}{2} \csc\left(x - \frac{\pi}{4}\right)$ $|A| = \frac{1}{2}$ $PS \Rightarrow \frac{\pi}{4}$

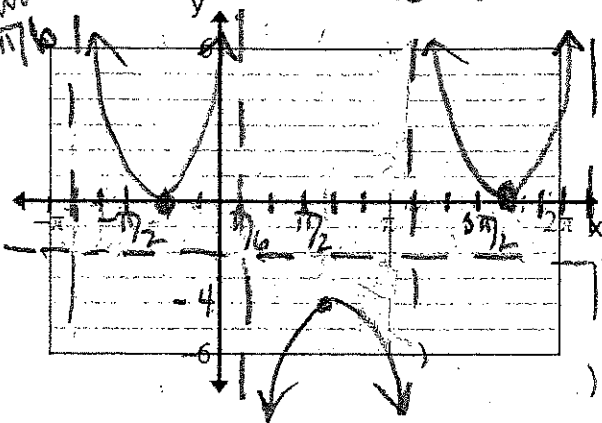


9. $y = 4 \sec(x - \pi)$ $|A| = 4$ $PS \Rightarrow \pi$

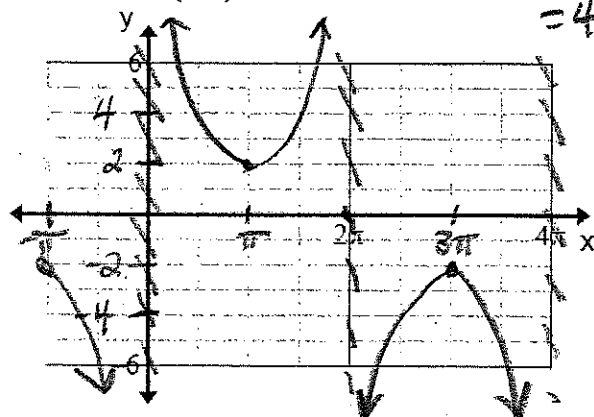


10. $y = 2 \sec\left(x + \frac{\pi}{3}\right) - 2$ $|A| = 2$ $PS = \left\langle \frac{\pi}{3} \right\rangle$
 $VS = \left\langle \frac{\pi}{6} \right\rangle$

intervals are $\frac{\pi}{6}$

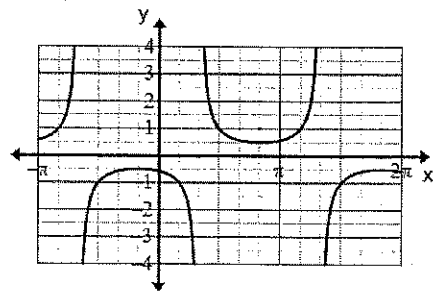


11. $y = 2 \csc\left(\frac{1}{2}x\right)$ $|A| = 2$ $NP = \frac{2\pi}{\frac{1}{2}} = 4\pi$

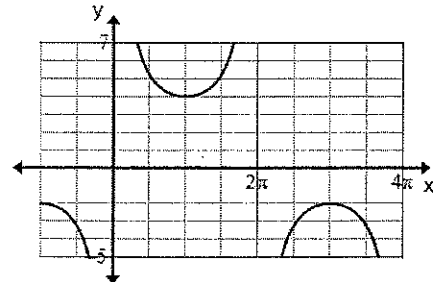


III. Write the equation for each function. See next pages for work.

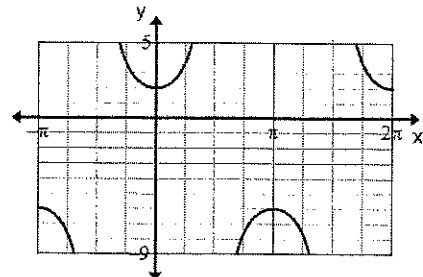
12.



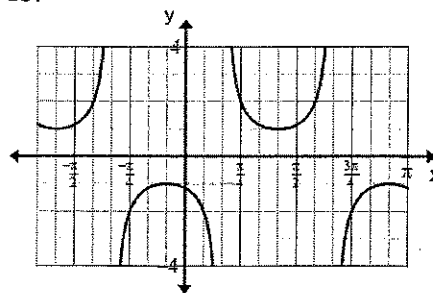
13.



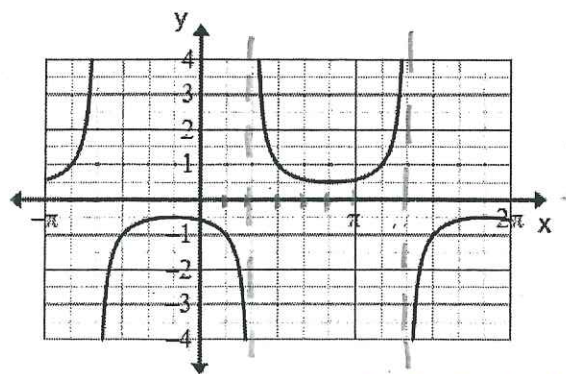
14.



15.



12.



- Intervals on x-axis = $\frac{\pi}{6}$
- Asymptotes located at $\frac{2\pi}{6}$ ($\frac{\pi}{3}$) and $\frac{8\pi}{6}$ ($\frac{4\pi}{3}$)
- $|A| = \frac{1}{2}$
- $NP = 2\pi$ $B = \frac{2\pi}{2\pi} = 1$ • $VS = \text{None}$

In terms of sec $PS = \rightarrow \frac{5\pi}{6}$

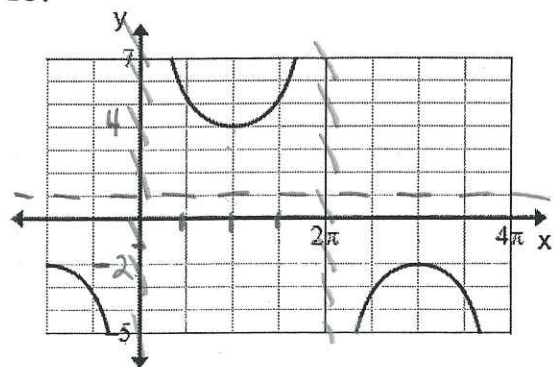
In terms of csc $PS = \rightarrow \frac{\pi}{3}$

$$y = \frac{1}{2} \sec\left(x - \frac{5\pi}{6}\right)$$

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

These are only 2 of the infinitely many equations that would create this graph.

13.



- Intervals on x-axis = $\frac{\pi}{2}$
- Asymptotes located at 0 and 2π
- $NP = 4\pi$ $B = \frac{2\pi}{4\pi} = \frac{1}{2}$
- $|A| = \frac{4 - (-2)}{2} = 3$
- $VS = \uparrow 1$

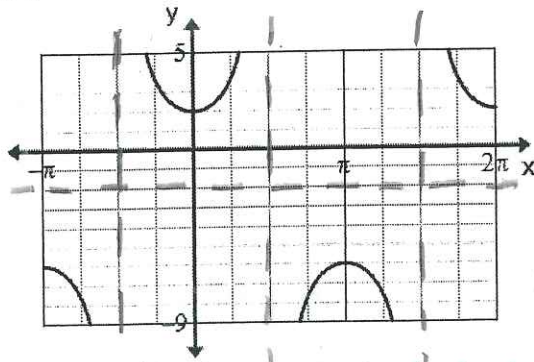
In terms of sec $PS = \rightarrow \pi$

In terms of csc $PS = \text{none}$

$$y = 3 \sec \left[\frac{1}{2} (x - \pi) \right] + 1$$

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

14.



- Intervals on x-axis = $\frac{\pi}{4}$
- Asymptotes located at $\frac{\pi}{2}$ and $\frac{3\pi}{2}$
- NP = 2π B = 1
- $|A| = \frac{2 - (-6)}{2} = 4$
- VS = $\downarrow 2$

In terms of sec PS = none

In terms of csc PS = $\rightarrow \frac{\pi}{2}$ (then use 4 for amplitude)

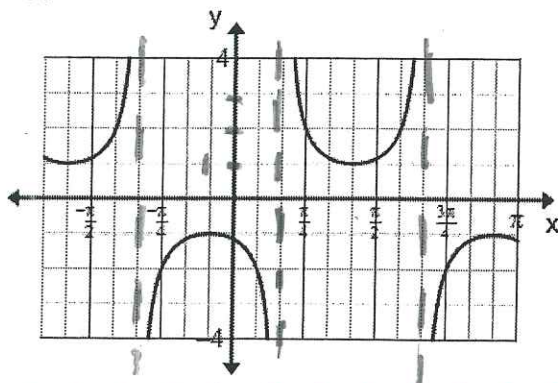
OR PS = $\leftarrow \frac{\pi}{2}$ (then use 4 for amplitude)

$$y = 4\sec(x) - 2$$

$$y = -4\sec\left(x - \frac{\pi}{2}\right) - 2$$

$$\text{OR } y = 4\sec\left(x + \frac{\pi}{2}\right) - 2$$

15.



- Intervals on x-axis = $\pi/2$
- Asymptotes located at $2\pi/2$ ($\pi/6$) and $\frac{8\pi}{12}$ ($\frac{2\pi}{3}$)
- $|A| = 1$
- $NP = \pi$ $B = \frac{2\pi}{\pi} = 2$ • $VS = \text{None}$
- In terms of sec $PS = \frac{5\pi}{12} \rightarrow$
- In terms of csc $PS = \pi/6 \rightarrow$

$$y = \sec \left[2 \left(x - \frac{5\pi}{12} \right) \right]$$

$$y = \csc \left[2 \left(x - \frac{\pi}{6} \right) \right]$$