Pre-Calculus

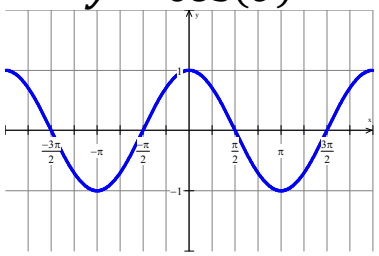
Write your questions and thoughts here!

10.3 Reciprocal Trig Graphs

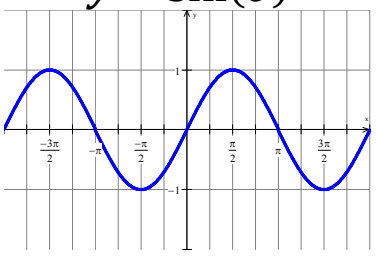
Name:_____

RECALL:

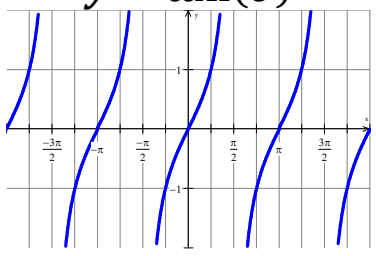
$y = \cos(\theta)$



$y = \sin(\theta)$

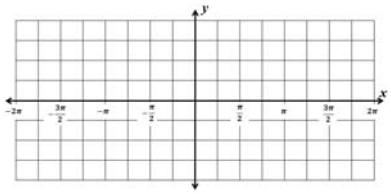


$y = \tan(\theta)$

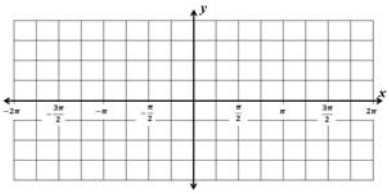


Reciprocal Graphs:

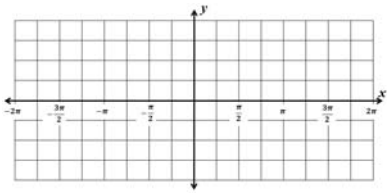
$y = \sec(\theta) =$



$y = \csc(\theta) =$



$y = \cot(\theta) =$

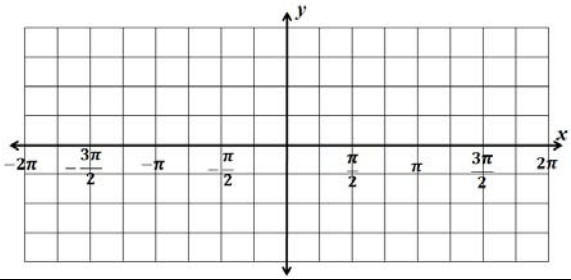


Identify the "amplitude", period, vertical shift, and phase shift before graphing.

1. $y = \csc\left(\frac{1}{2}\left(x + \frac{\pi}{4}\right)\right)$

"Amp": Period:

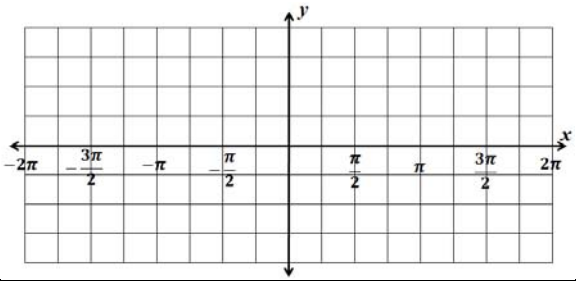
Vertical Shift: Phase Shift:



2. $y = -2\sec(2x - \pi) - 1$

"Amp": Period:

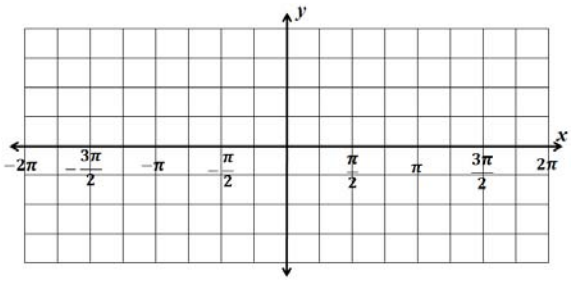
Vertical Shift: Phase Shift:



3. $y = \cot\left(\frac{1}{2}x + \frac{\pi}{8}\right)$

"Amp": Period:

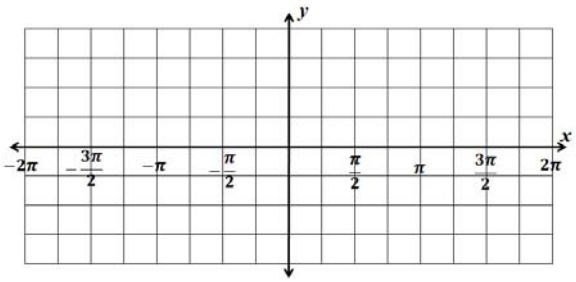
Vertical Shift: Phase Shift:



4. $y = 3\csc(x + \pi) + 1$

"Amp": Period:

Vertical Shift: Phase Shift:



10.3 Practice – Reciprocal Trig Graphs

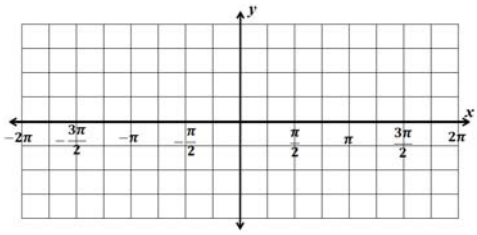
Name: _____

Pre-Calculus

For 1-12, graph the trig function.

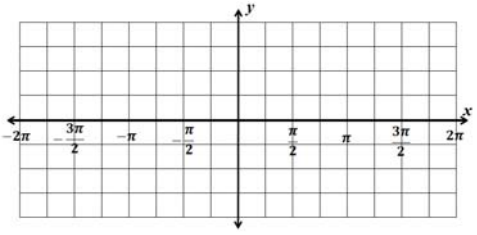
1. $y = \sec\frac{\theta}{2}$

Amp Period P.S. V.S.



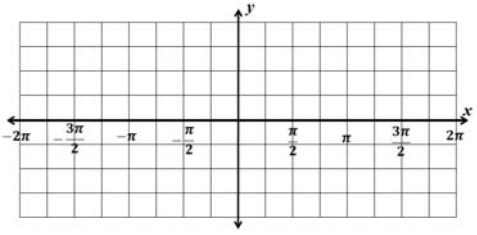
2. $y = \csc 2\theta$

Amp Period P.S. V.S.



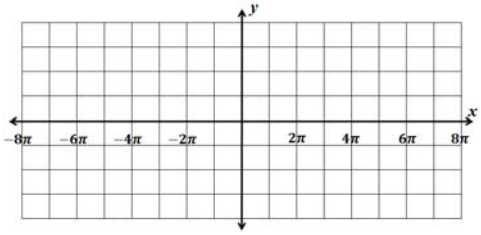
3. $y = 3\csc\theta$

Amp Period P.S. V.S.



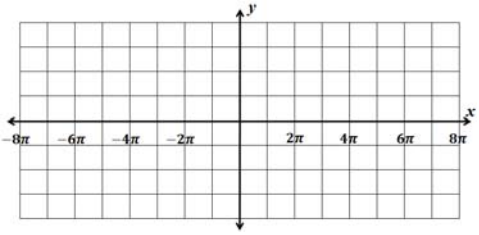
4. $y = 1 + \frac{1}{2}\cot\frac{\theta}{3}$

Amp Period P.S. V.S.



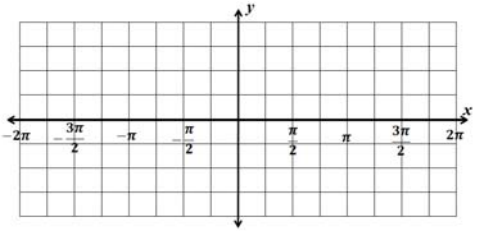
5. $y = \frac{1}{2}\sec\frac{\theta}{3} + 2$

Amp Period P.S. V.S.



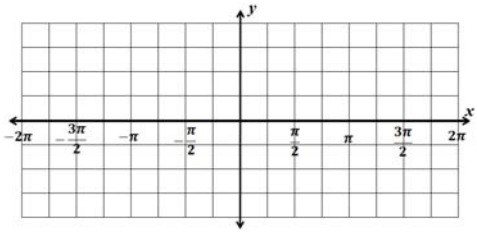
6. $y = 2\sec\frac{\theta}{2} - 1$

Amp Period P.S. V.S.



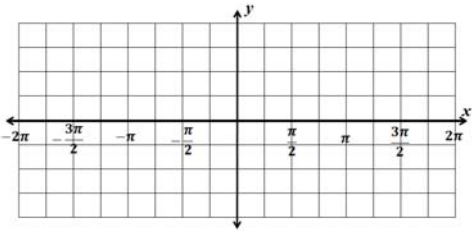
7. $y = 3\csc 2\theta + 1$

Amp Period P.S. V.S.



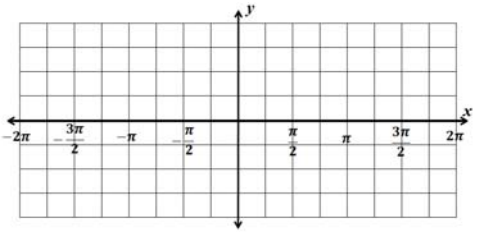
8. $y = 2\sec(2\theta + \pi) + 1$

Amp Period P.S. V.S.



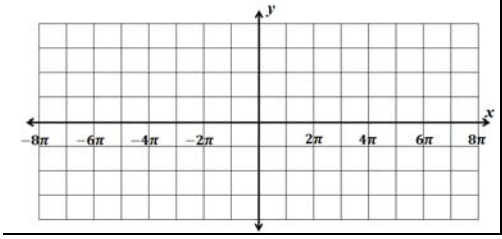
9. $y = 2\cot\left(\frac{\theta}{2} - \frac{\pi}{4}\right) - 1$

Amp Period P.S. V.S.



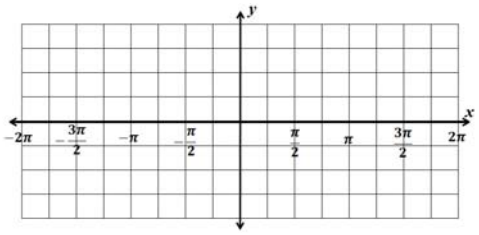
10. $y = 2\sec\left(\frac{\theta}{3} + \frac{\pi}{6}\right) + 1$

Amp Period P.S. V.S.



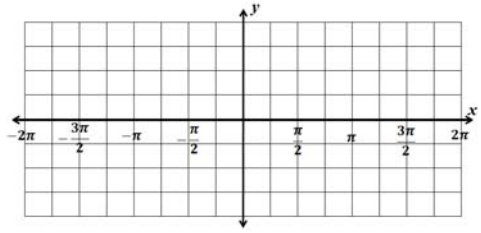
11. $y = 2\cot(2\theta + \pi) - 2$

Amp Period P.S. V.S.



12. $y = 2\csc\left(\frac{\theta}{2} - \frac{\pi}{2}\right) - 1$

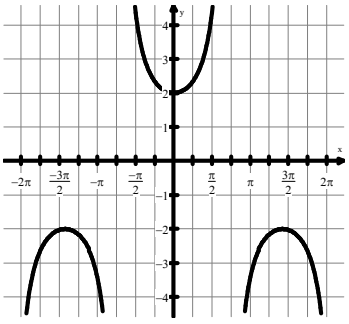
Amp Period P.S. V.S.



Skillz Review: Separate Fractions		
$\frac{5x - 20}{5} =$	$\frac{\cos x - 1}{\cos x} =$	$\frac{\sin\theta + \cos\theta}{\sin\theta} =$
Skillz Review: Multiply Fractions		
$\frac{32}{5} \cdot \frac{7}{32} =$	$\sin x \cdot \frac{1}{\sin x} =$	$\sin\theta \cdot \csc\theta =$

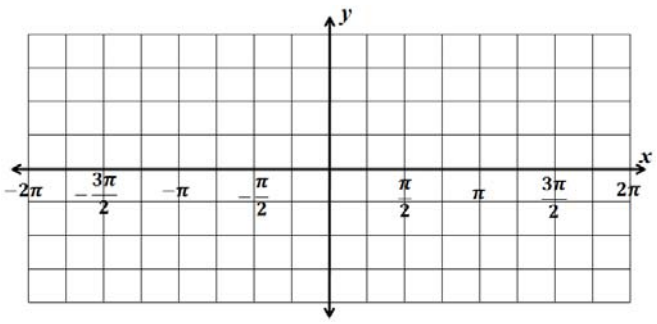
10.3 Application and Extension

1.



If the above graph has no phase shift, is it a secant, cosecant, or cotangent function?

2. Graph $f(\theta) = 3\csc\left(\frac{\theta}{2} + \frac{\pi}{2}\right) + 1$



The following application problems are for **sinusoids**, not reciprocal graphs. There are so many great applications for sinusoids that we just can't get enough of them!

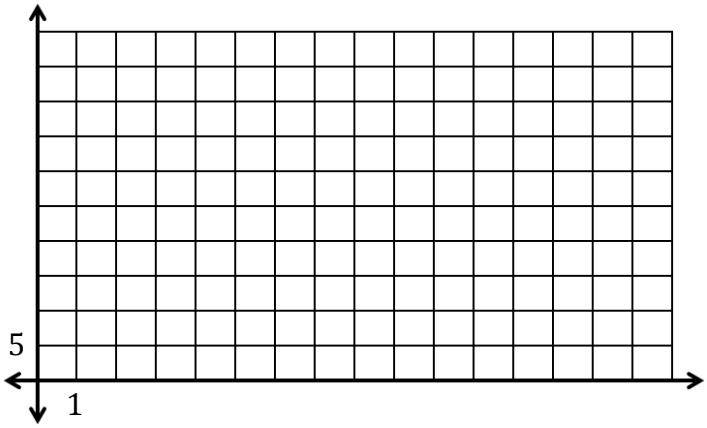
3. Recall that the standard equation of a sine curve is $\boldsymbol{y = a\sin\big(b(x-h)\big)+k}$

   Write a sine function of a curve with the following criteria:

   - Maximum value of 7.
   - Minimum value of -1.
   - It repeats every 8 units.
   - The point $\left(-\frac{\pi}{2}, 3\right)$ is on the graph and it is increasing at that point. (Remember, this coordinate point is like a (x, y) coordinate point that you can plug in and solve for the values you don't have!)

4. Mr. Brust rides his lady's bicycle to school on most days. The pedals are mounted on a bracket whose center is 29 cm above the ground. Each pedal is 16.5 cm from the center of the bracket. Assume that the bicycle is pedaled at 12 cycles per minute (RATE OF CHANGE IS FREQUENCY). With the starting position of the pedals in a horizontal position at $t = 0$. (This does NOT match the picture!)

   a. Label the graph with time (seconds) on the x-axis. Each line will represent one second.
   b. Label the y-axis as height (cm) from the ground. Each line will represent 5 cm.
   c. Sketch the graph of this sinusoidal function for the first three cycles.



   d. Write the equation of the sine curve with the time given in seconds.

   e. When is the pedal 40 cm above the ground for the 3rd time?

   f. How high is the pedal after 23 seconds?