

Trig Graphing WS  
Sine, Cosine, Cosc, Secant

Name Key

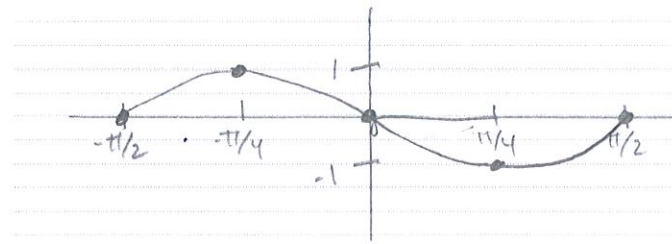
Graph one complete period for each function and give the period, and domain and range of that period.

1)  $y = \sin(2x + \pi)$

$$2x + \pi = 0 \quad 2x + \pi = 2\pi$$

$$2x = -\pi \quad 2x = 2\pi - \pi$$

$$x = -\frac{\pi}{2} \quad x = \frac{\pi}{2}$$



amp = 1  
period =  $\frac{\pi}{2} - (-\frac{\pi}{2}) = \pi$   
PS =  $-\frac{\pi}{2}$   
VS = 0  
D:  $[-\frac{\pi}{2}, \frac{\pi}{2}]$   
R:  $[-1, 1]$

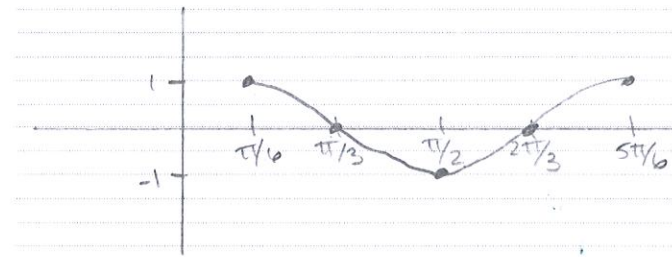
2)  $y = \cos(3x - \frac{\pi}{2})$

$$3x - \frac{\pi}{2} = 0 \quad 3x - \frac{\pi}{2} = 2\pi$$

$$\frac{1}{3}3x = \frac{\pi}{2} \cdot \frac{1}{3} \quad 3x = \frac{4\pi}{2} + \frac{\pi}{2}$$

$$x = \frac{\pi}{6} \quad \frac{1}{3}3x = \frac{5\pi}{2} \cdot \frac{1}{3}$$

$$x = \frac{5\pi}{6}$$



amp = 1  
period =  $\frac{5\pi}{6} - \frac{\pi}{6} = \frac{4\pi}{6} = \frac{2\pi}{3}$   
D:  $[\frac{\pi}{6}, \frac{5\pi}{6}]$   
R:  $[-1, 1]$

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

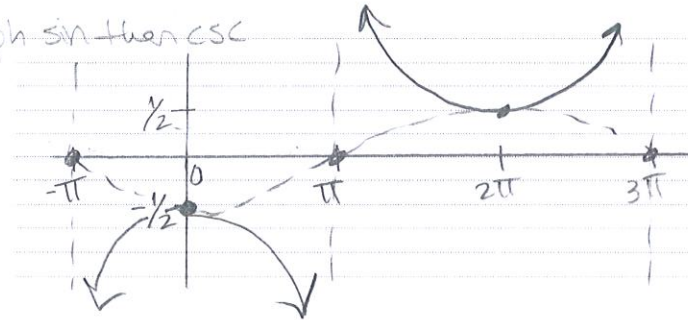
\*graph sin then csc

$$\frac{1}{2}x + \frac{\pi}{2} = 0 \quad \frac{1}{2}x + \frac{\pi}{2} = 2\pi$$

$$\frac{1}{2}x = -\frac{\pi}{2} \cdot 2 \quad \frac{1}{2}x = \frac{4\pi}{2} - \frac{\pi}{2}$$

$$x = -\pi \quad \frac{1}{2}x = \frac{3\pi}{2} \cdot 2$$

$$x = 3\pi$$



Reflect  
Amp 1/2  
period  $3\pi - \pi = 2\pi$   
D:  $(-\pi, \pi) \cup (\pi, 3\pi)$   
R:  $(-\infty, -\frac{1}{2}] \cup [\frac{1}{2}, \infty)$

4)  $y = -\cos(-x - \pi) - 3$

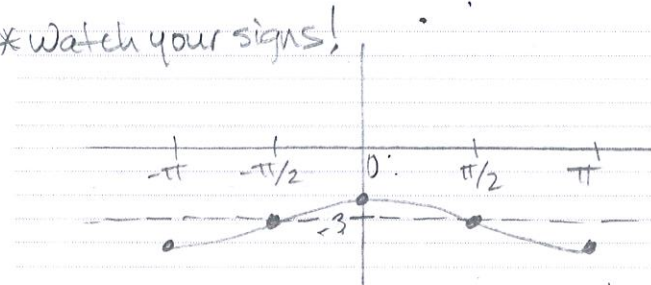
\*watch your signs!

$$y = -\cos(-(x + \pi)) - 3$$

$$y = -\cos(x + \pi) - 3$$

$$x + \pi = 0 \quad x + \pi = 2\pi$$

$$x = -\pi \quad x = \pi$$



Reflect  
Amp 1  
period =  $\pi - (-\pi) = 2\pi$   
VS -3  
D:  $[-\pi, \pi]$   
R:  $[-4, -2]$

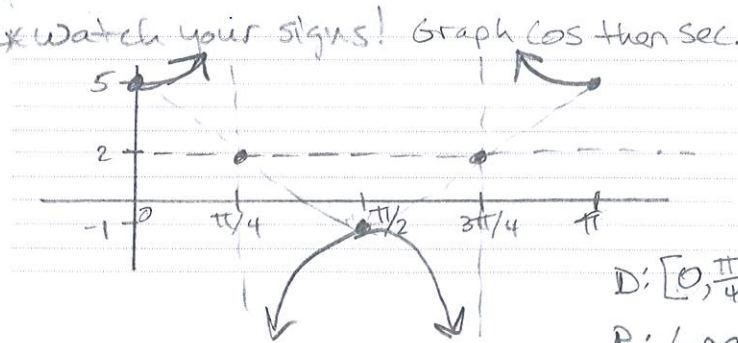
5)  $y = 3 \sec(-2x) + 2$

\*watch your signs! Graph cos then sec.

$$y = 3 \sec(2x) + 2$$

$$2x = 0 \quad 2x = 2\pi$$

$$x = 0 \quad x = \pi$$



amp 3  
period  $\pi$   
VS 2  
D:  $[0, \frac{\pi}{4}) \cup (\frac{\pi}{4}, \frac{3\pi}{4}) \cup (\frac{3\pi}{4}, \pi]$   
R:  $(-\infty, -1] \cup [-5, \infty)$

$$6) y = \csc\left(3x - \frac{\pi}{2}\right)$$

$$3x - \frac{\pi}{2} = 0 \quad 3x - \frac{\pi}{2} = 2\pi$$

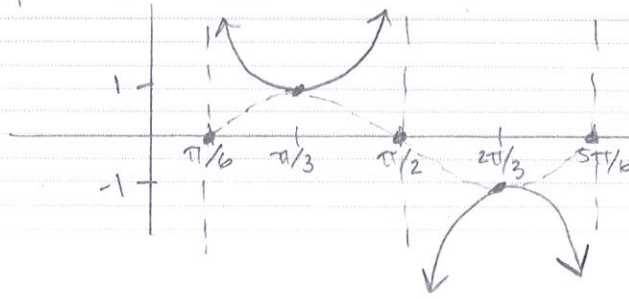
$$\left(\frac{4}{3}\right) 3x = \frac{\pi}{2} \left(\frac{1}{3}\right) \quad 3x = \frac{4\pi + \pi}{2} \left(\frac{1}{3}\right)$$

$$x = \frac{\pi}{6}$$

$$3x = \frac{5\pi}{2} \left(\frac{1}{3}\right)$$

$$x = \frac{5\pi}{6}$$

\* graph sin then csc



$$\text{amp } 1$$

$$\text{period } \frac{5\pi}{6} - \frac{\pi}{6} = \frac{4\pi}{6} = \frac{2\pi}{3}$$

$$D: \left(\frac{\pi}{6}, \frac{\pi}{2}\right) \cup \left(\frac{\pi}{2}, \frac{5\pi}{6}\right)$$

$$R: (-\infty, -1] \cup [1, \infty)$$

$$7) y = 2\sin(4x + \pi) + 1$$

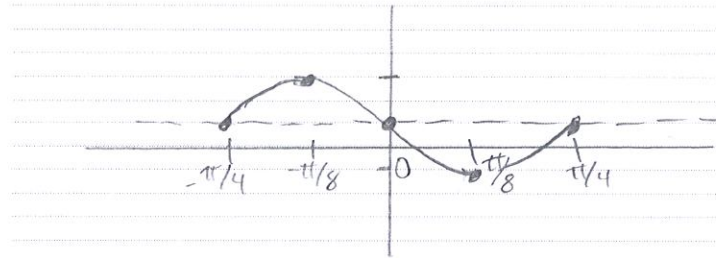
$$4x + \pi = 0 \quad 4x + \pi = 2\pi$$

$$4x = -\pi$$

$$x = -\frac{\pi}{4}$$

$$4x = \pi$$

$$x = \frac{\pi}{4}$$



amp 2

$$\text{vs } 1$$

$$\text{period } \frac{\pi}{4} - \left(-\frac{\pi}{4}\right) = \frac{2\pi}{4} = \frac{\pi}{2}$$

$$D: \left[-\frac{\pi}{4}, \frac{\pi}{4}\right]$$

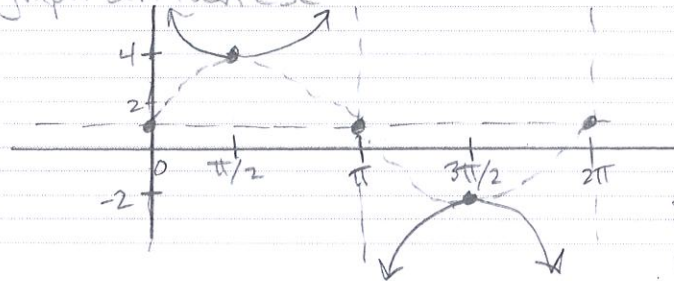
$$R: [-1, 3]$$

$$8) y = 3\csc x + 1$$

$$x = 0$$

$$x = 2\pi$$

\* graph sin then csc



amp 3

vs 1

$$\text{period } 2\pi$$

$$D: (0, \pi) \cup (\pi, 2\pi)$$

$$R: (-\infty, -2] \cup [4, \infty)$$

$$9) y = 2\sec(4x + \pi) - 1$$

$$4x + \pi = 0 \quad 4x + \pi = 2\pi$$

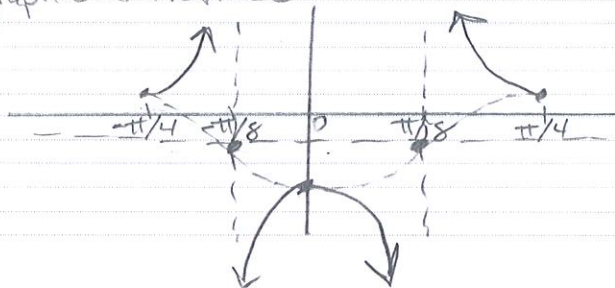
$$4x = -\pi$$

$$x = -\frac{\pi}{4}$$

$$4x = \pi$$

$$x = \frac{\pi}{4}$$

\* graph cos then sec



amp 2

vs -1

$$\text{period } \frac{\pi}{4} - \left(-\frac{\pi}{4}\right) = \frac{2\pi}{4} = \frac{\pi}{2}$$

$$D: \left[-\frac{\pi}{4}, -\frac{\pi}{8}\right) \cup \left(-\frac{\pi}{8}, \frac{\pi}{8}\right) \cup \left(\frac{\pi}{8}, \frac{\pi}{4}\right)$$

$$R: (-\infty, -3] \cup [1, \infty)$$

$$10) y = \frac{1}{2}\sin(8x - 4\pi) + 1$$

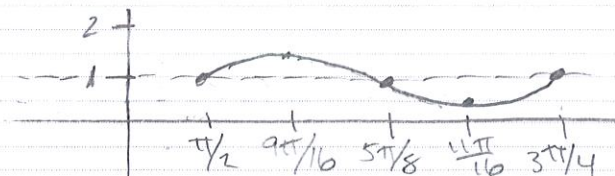
$$8x - 4\pi = 0 \quad 8x - 4\pi = 2\pi$$

$$8x = 4\pi$$

$$x = \frac{4\pi}{8} = \frac{\pi}{2}$$

$$8x = 6\pi$$

$$x = \frac{6\pi}{8} = \frac{3\pi}{4}$$



amp 1/2

vs 1

$$\text{period } \frac{3\pi}{4} - \frac{\pi}{4} = \frac{2\pi}{4} = \frac{\pi}{2}$$

$$D: \left[\frac{\pi}{2}, \frac{3\pi}{4}\right]$$

$$R: \left[\frac{1}{2}, \frac{3}{2}\right]$$

$\pi$  x-axis

$$\left\{ \begin{array}{l} \frac{\pi}{4} \left(\frac{1}{2}\right) = \frac{\pi}{8} \\ \frac{\pi}{8} + \frac{\pi}{2} = \frac{\pi}{8} + \frac{4\pi}{8} = \frac{5\pi}{8} \\ \frac{5\pi}{8} - \frac{\pi}{2} = \frac{5\pi}{8} - \frac{4\pi}{8} = \frac{\pi}{8} \\ \frac{\pi}{2} + \frac{\pi}{16} = \frac{8\pi}{16} + \frac{\pi}{16} = \frac{9\pi}{16} \end{array} \right.$$