

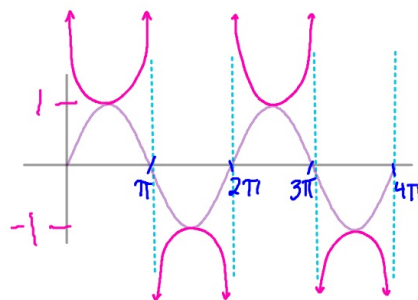
October 12

SWBAT:

Sketch graphs of  
transformations of  
secant and cosecant

Graph of  
Cosecant

$$\csc x = \frac{1}{\sin x}$$



vertical  
asymptotes  
when  $\sin x = 0$   
( $x = \pi, 2\pi, 3\pi, \dots$ )

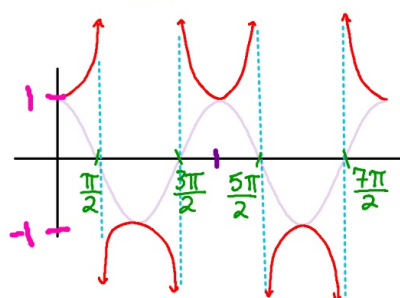
Domain: all real #s except  
 $\pi, 2\pi, 3\pi, \dots, n\pi$

Range:  $y \leq -1$ ,  $y \geq 1$

Length of one cycle =  $2\pi$

# Graph of Secant

$$\sec x = \frac{1}{\cos x}$$



vertical asymptotes  
when  $\cos x = 0$   
 $x = \frac{\pi}{2}, \frac{3\pi}{2}, \frac{5\pi}{2}, \dots$

Domain: all real #s except  
 $\frac{\pi}{2}, \frac{3\pi}{2}, \frac{5\pi}{2}, \dots, \frac{(2n+1)\pi}{2}$

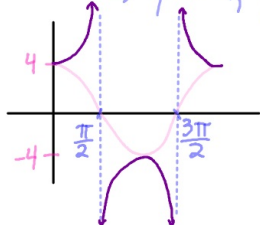
Range:  $y \leq -1, y \geq 1$

Length of one cycle =  $2\pi$

$$y = 4 \sec x$$

4 = amplitude

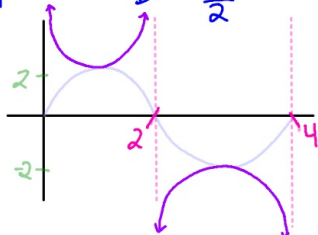
$\rightarrow y \leq -4, y \geq 4$



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

amplitude = 2  $\rightarrow y \leq -2, y \geq 2$

$$\text{period} = \frac{2\pi}{b} = \frac{2\pi}{\frac{\pi}{2}} = 2\pi \cdot \frac{2}{\pi} = 4$$

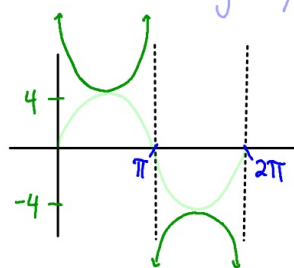


- ① identify changes  
• sketch the opposite function (sine or cosine)
- ② labeled y-axis  
+ draw in asymptotes
- ③ label x-axis
- ④ sketch the secant/cosecant curve

Graph  
 $y = 4\csc x$

amplitude = 4

→ range  $y \leq -4, y \geq 4$

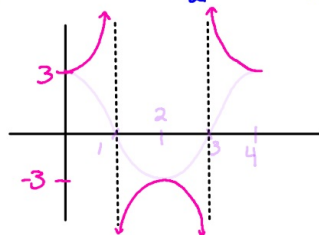


$y = 3\sec\left(\frac{\pi}{2}x\right)$

amplitude = 3 →  $y \leq -3, y \geq 3$

vertical shift = 0

period =  $\frac{2\pi}{b} = \frac{2\pi}{\frac{\pi}{2}} = 2\pi \cdot \frac{2}{\pi} = 4$



- ① lightly draw in sine/cosine
- ② label x-axis & draw in vertical asymptotes
- ③ draw csc/sec curve
- ④ label y-axis