

# Warm-Up

1. What is the reciprocal of sine? *csc*
2. What is the reciprocal of cosine? *sec*
3. Using numbers, give an example of a reciprocal.

\*\*you may want a colored pencil....

## 8.4

### Graphing Cosecant and secant Graphs

## Steps for Graphing Cosecant & Secant

1. Graph the cosecant and secant functions as if they were sine or cosine functions (dotted curves).
2. Draw vertical asymptotes at all points on the midline.
3. Draw "u" shaped curves at any minimum or maximum points.

Find the important information for **one period** of the equation, then graph.

1.  $y = \csc x$

A = DNE

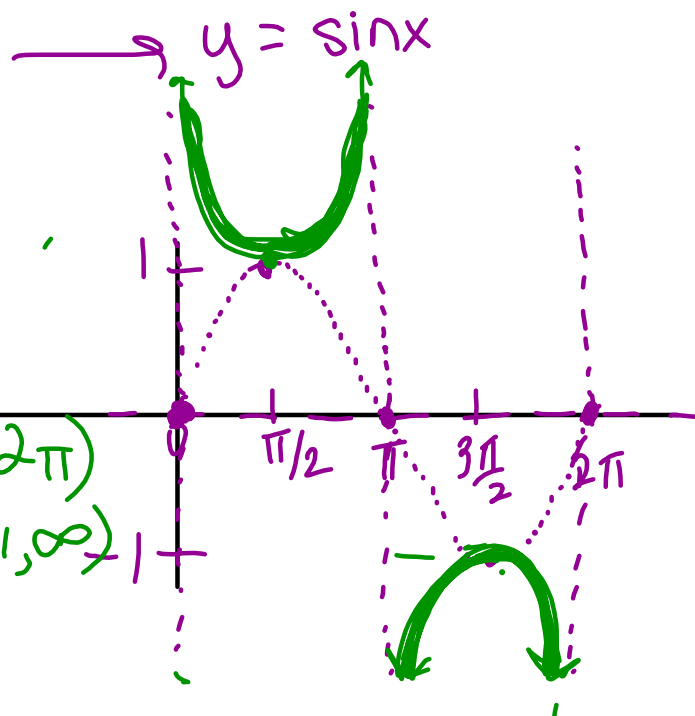
P =  $2\pi$

V.S. =  $\emptyset$

H.S. =  $\emptyset$

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

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



2.  $y = \sec x$

A = DNE

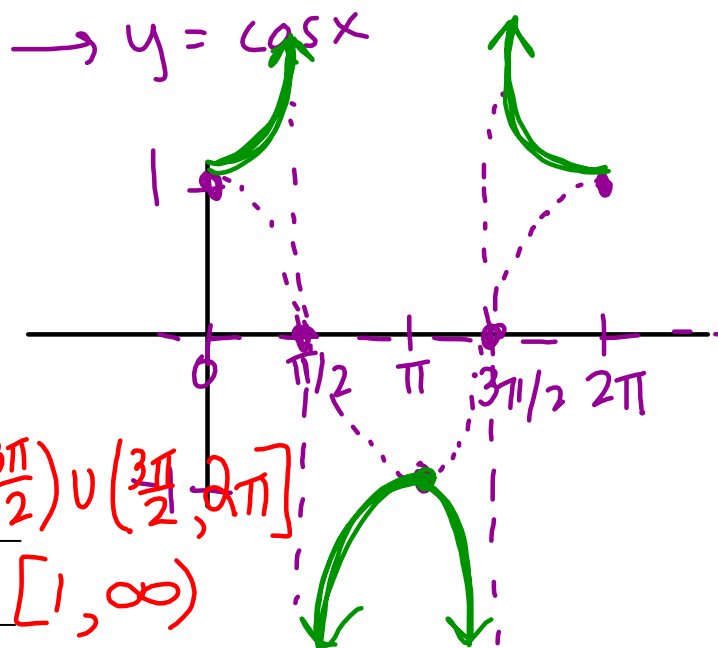
P =  $2\pi$

V.S. =  $\emptyset$

H.S. =  $\emptyset$

Domain:  $[0, \frac{\pi}{2}) \cup (\frac{\pi}{2}, \frac{3\pi}{2}) \cup (\frac{3\pi}{2}, 2\pi]$

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



3.  $y = -3\sec \frac{1}{4}x$

A = \_\_\_\_\_

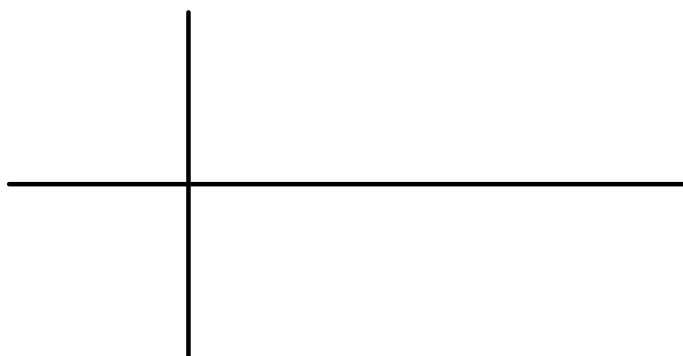
P = \_\_\_\_\_

V.S. = \_\_\_\_\_

H.S. = \_\_\_\_\_

Domain: \_\_\_\_\_

Range: \_\_\_\_\_



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

$$\begin{aligned} 0 \cdot \frac{1}{2} &= 0 - \frac{\pi}{4} = -\frac{\pi}{4} \\ \frac{\pi}{2} \cdot \frac{1}{2} &= \frac{\pi}{4} - \frac{\pi}{4} = 0 \\ \pi \cdot \frac{1}{2} &= \frac{\pi}{2} - \frac{\pi}{4} = \frac{\pi}{4} \\ \frac{3\pi}{2} \cdot \frac{1}{2} &= \frac{3\pi}{4} - \frac{\pi}{4} = \frac{\pi}{2} \\ &= \pi - \frac{\pi}{4} = \frac{3\pi}{4} \end{aligned}$$

A = DNE

P =  $\pi$

V.S. = 2

H.S. =  $\frac{\pi}{4}$

Domain:  $\left(-\frac{\pi}{4}, \frac{\pi}{4}\right) \cup \left(\frac{\pi}{4}, \frac{3\pi}{4}\right)$

Range:  $(-\infty, 1.5] \cup [2.5, \infty)$

