5.4 Part 2 More Trigonometric Graphs

Because csc and sec are reciprocals of sin and cos, they have the same period of 2π.

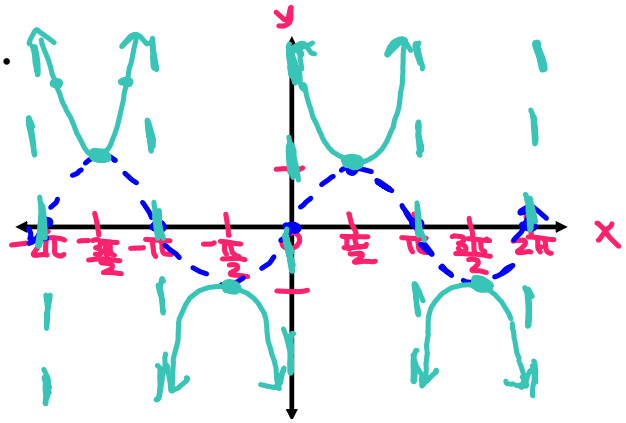
To graph csc and sec, we use the reciprocal identities.

$$\csc x = \frac{1}{\sin x} \qquad \sec x = \frac{1}{\cos x}$$

To graph $y = \csc x$, we take the reciprocals of the y-coordinates of the points of the graph $y = \sin x$.

Example 1

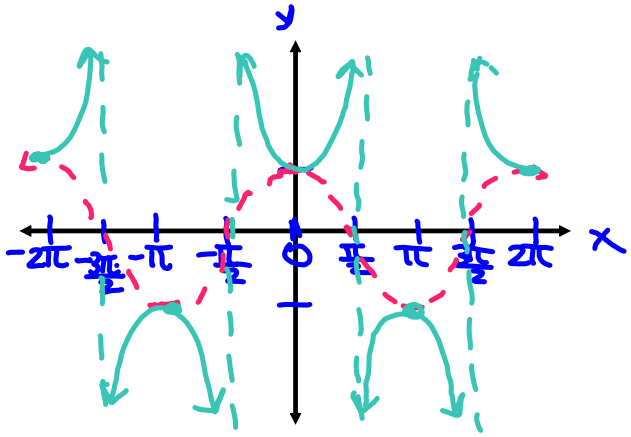
Graph $y = \csc x$.



To graph $y = \sec x$, we take the reciprocals of the y-coordinates of the points of the graph $y = \cos x$.

Example 2

Graph $y = \sec x$.



Example 3

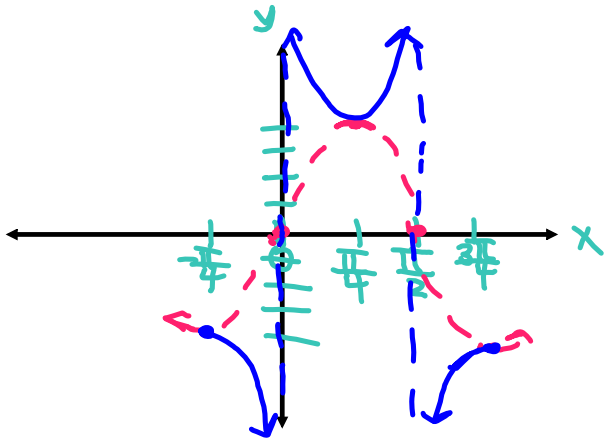
reflection amp = 4 per = $\frac{2\pi}{2} = \pi$ ps = $\frac{\pi}{4}$ left vs = $\emptyset$

Graph $y = -4 \sec (2x + \frac{\pi}{2})$.

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

$-\frac{\pi}{4} + \frac{4\pi}{4} = \frac{3\pi}{4}$

$\frac{1}{2}(-\frac{\pi}{4} + \frac{3\pi}{4}) = \frac{\pi}{4}$



Example 4

amp = $\frac{1}{2}$ per = $\frac{2\pi}{3}$ ps = $\frac{\pi}{3}$ right vs = 1 up

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

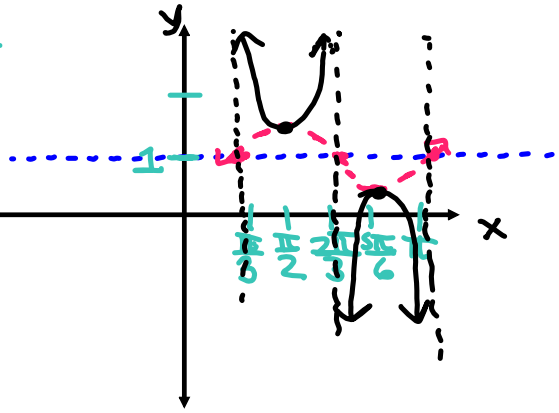
$y = \frac{1}{2} \csc 3(x - \frac{\pi}{3}) + 1$

$\frac{\pi}{3} + \frac{2\pi}{3} = \pi$ end

$\frac{1}{2}(\frac{\pi}{3} + \frac{3\pi}{3}) = \frac{1}{2} \cdot \frac{4\pi}{3} = \frac{2\pi}{3}$

$\frac{1}{2}(\frac{\pi}{3} + \frac{2\pi}{3}) = \frac{1}{2} \cdot \frac{3\pi}{3} = \frac{\pi}{2}$

$\frac{1}{2}(\frac{2\pi}{3} + \frac{3\pi}{3}) = \frac{1}{2} \cdot \frac{5\pi}{3} = \frac{5\pi}{6}$



ALL SIX TRIGONOMETRIC FUNCTIONS