

Reciprocal Identities

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

If $\cos x = 0$, then $\sec x$ is undefined (VA)

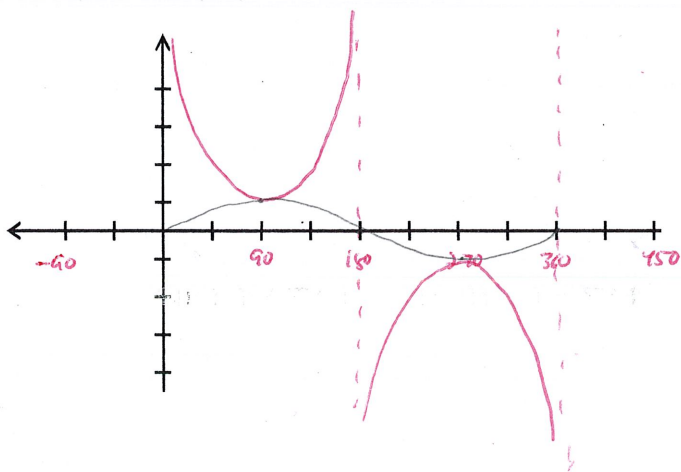
$$\csc x = \frac{1}{\sin x}$$

If $\sin x = 0$, then $\csc x$ is undefined (VA)

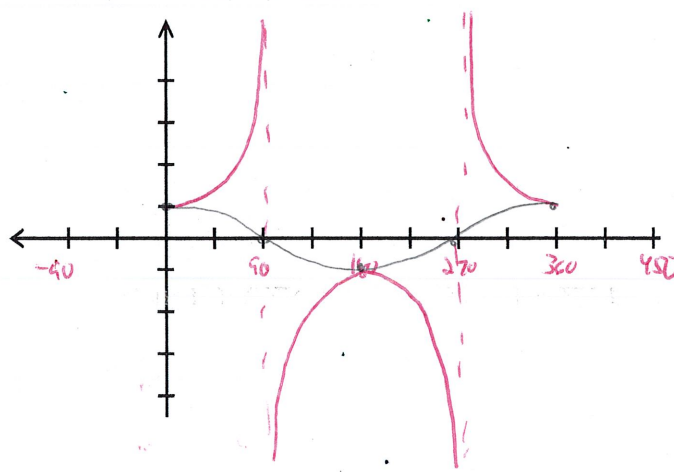
To graph $\csc x$ / $\sec x$:

1. Graph $y = \sin x$ for $\csc x$ and $y = \cos x$ for $\sec x$
2. Locate the vertical asymptotes –

Example 1: Graph $y = \csc x$



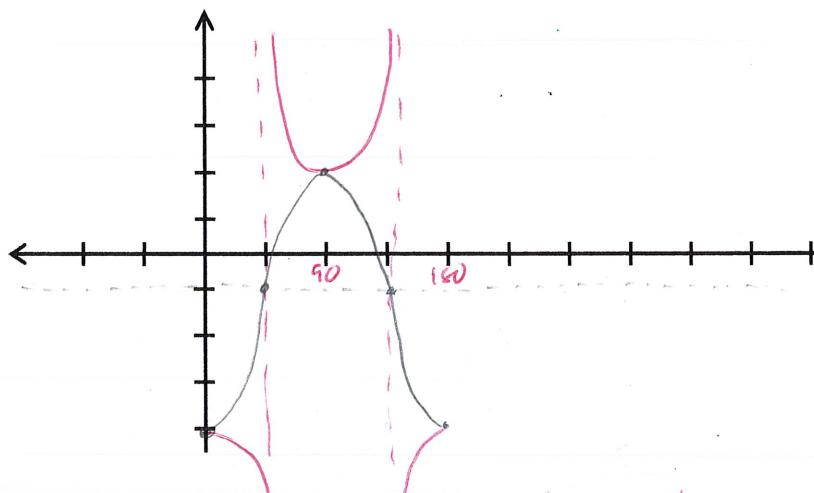
Example 2: Graph $y = \sec x$



Example 3: Graph $y = -3\sec(2x) - 1$

$$y = -3\cos(2x) - 1$$

- Amplitude: 3
 Period: 180
 Vertical Shift: -1
 Horizontal Shift: 0
 Start: 0
 End: 180
 Increments: 45



Example 4: Graph $y = -2\csc\left(\frac{x}{2} - \frac{\pi}{2}\right) + 3$

- Amplitude: 2
 Period: 4π
 Vertical Shift: 3
 Horizontal Shift: π
 Start: π
 End: 5π
 Increments: π

