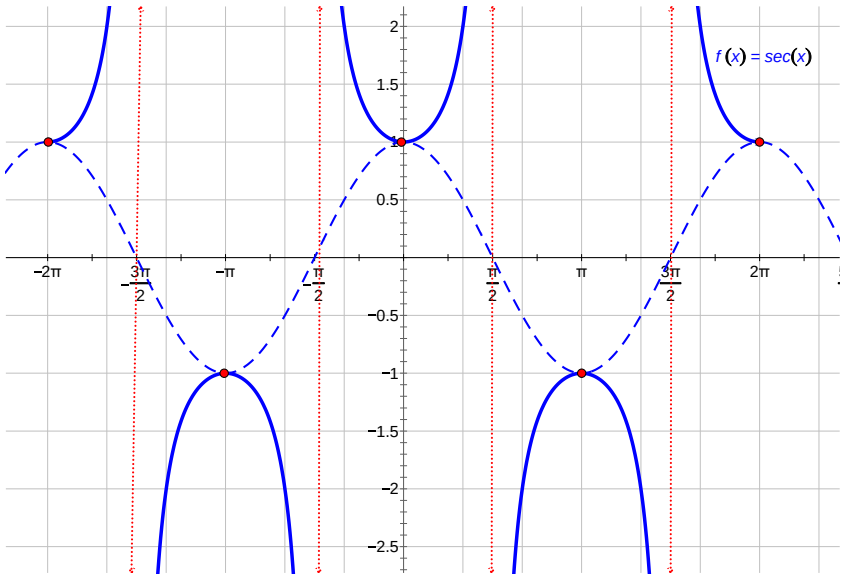
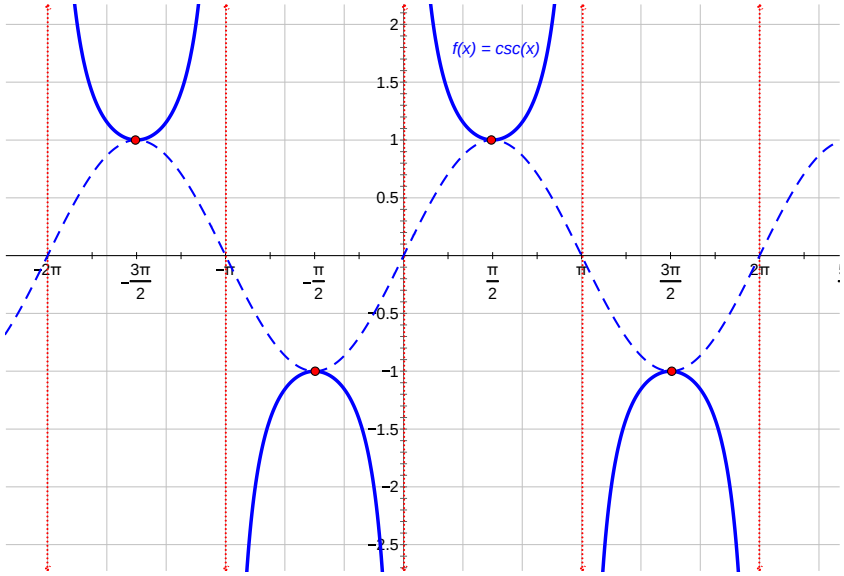
Topic	Notes	Examples/Questions

Parent Functions

$f(x) = \sec x$



$f(x) = \csc x$



Understanding the Parent Functions

Vertical Asymptotes:

- Because $\sec x = \frac{1}{\cos x}$, there are vertical asymptotes everywhere $\cos x = 0$.

Min/Max:

- Because $\sec x = \frac{1}{\cos x}$, everywhere $\cos x = 1, \sec x = \frac{1}{1} = 1$. Likewise, everywhere $\cos x = -1, \sec x = \frac{1}{-1} = -1$.

Parabola-like Shape:

- Between the min/max and roots of $y = \cos x$, x gets closer to 0. This means that $\frac{1}{\cos x}$ gets bigger going toward ±infinity.

- So, $y = \sec x$ goes toward ±infinity between the min/max and the vertical asymptotes.

Steps for Sketching Secant and Cosecant(4)

1) Graph the underlying sine (for cosecant) or cosine (for secant) graph.

2) Plot vertical asymptotes where the underlying sin/cos crosses the centerline.

3) Mark all the min and max visible on the underlying sin/cos.

4) Sketch the sec/csc by drawing parabola-like curves between the asymptotes and through the points marked step 3.

Example