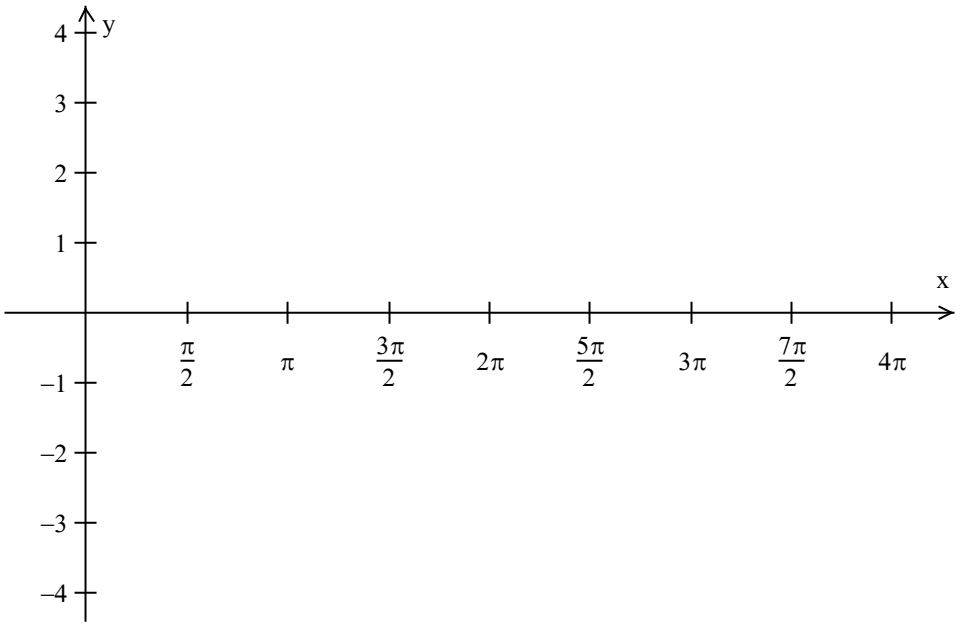
Name_____

Activity – Graphs of Secant and Cosecant Functions

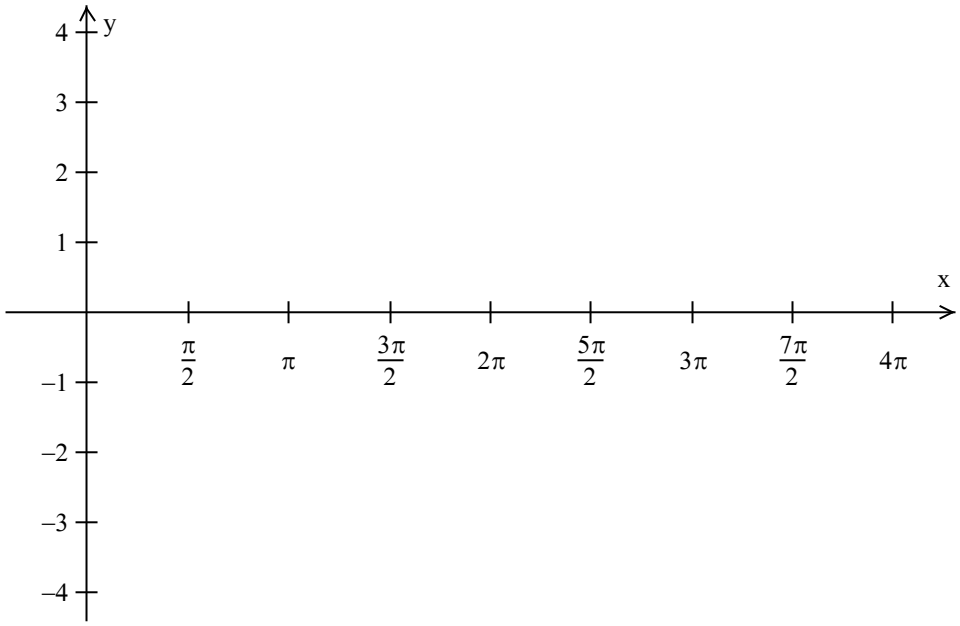
We are interested in the graphs of secant and cosecant functions. Again we will look at the basic graphs and then transformations of them.

Part 1. The Basic Secant and Cosecant Function Graphs. Complete the table on the left below. For irrational values, also give a one decimal place approximate. Write a U if the function is undefined at the given value. Then plot those values on the Cartesian Plane given to the right. Undefined values signify a vertical asymptote. Choose values near a vertical asymptote and use your calculator to find the trig function value. What happens near each asymptote? Using this knowledge, complete each graph.

x	$\sec(x)$	$\csc(x)$
0		
$\frac{\pi}{6}$		
$\frac{\pi}{4}$		
$\frac{\pi}{3}$		
$\frac{\pi}{2}$		
$\frac{2\pi}{3}$		
$\frac{3\pi}{4}$		
$\frac{5\pi}{6}$		
π		
$\frac{7\pi}{6}$		
$\frac{5\pi}{4}$		
$\frac{4\pi}{3}$		
$\frac{3\pi}{2}$		
$\frac{5\pi}{3}$		
$\frac{7\pi}{4}$		
$\frac{11\pi}{6}$		
2π		



$$F(x) = \sec(x)$$



$$G(x) = \csc(x)$$

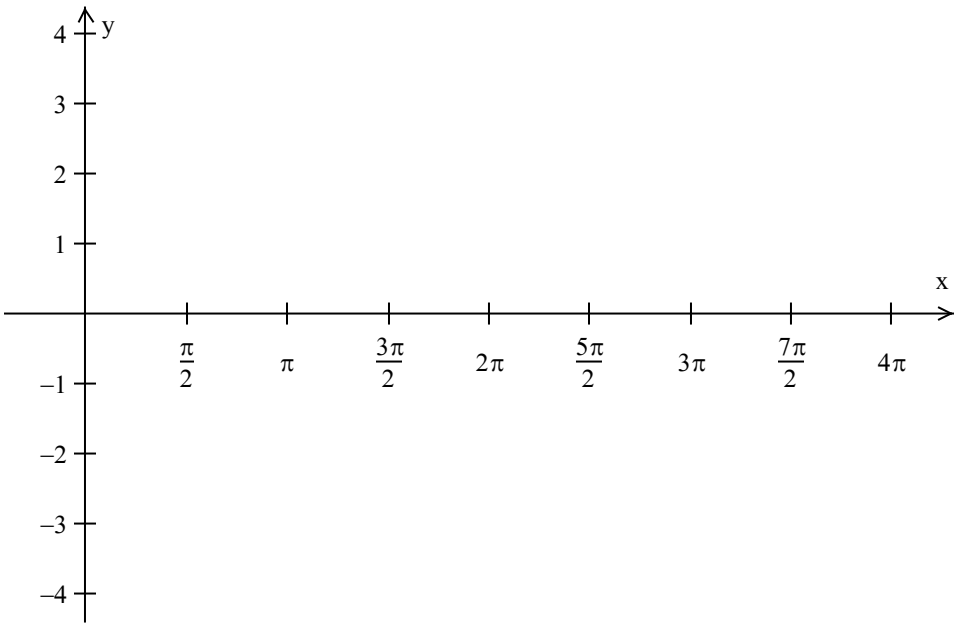
	Period	Domain	Range	*y*-intercept	Equations of Asymptotes
$y = \sec(x)$					
$y = \csc(x)$					

Part 2. Connections to Reciprocal Functions

1. We are going to use the graph of $C(x) = \cos(x)$ as a sketching aid for its reciprocal function.
   a) Graph $C(x) = \cos(x)$.

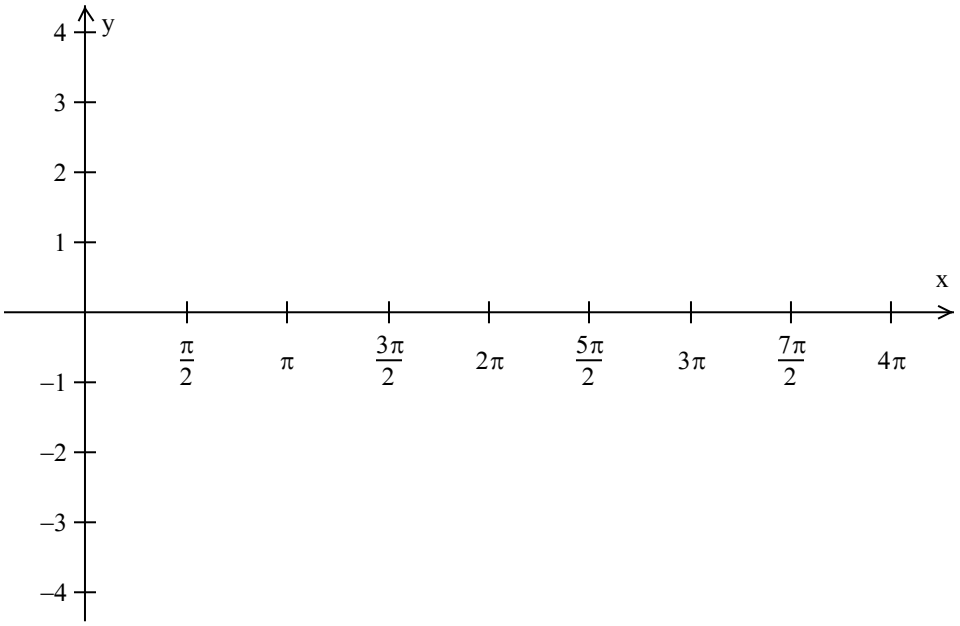
   b) Draw a vertical asymptote at each *x* intercept.

   c) Plot a point at each max or min of this graph and head towards the asymptotes on either side. If you have a different color, do this step in a different color than part a and b.

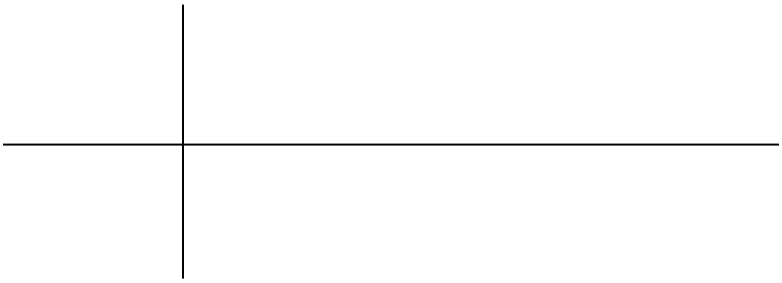


2. a) Graph $y = 2\cos(x) + 1$.

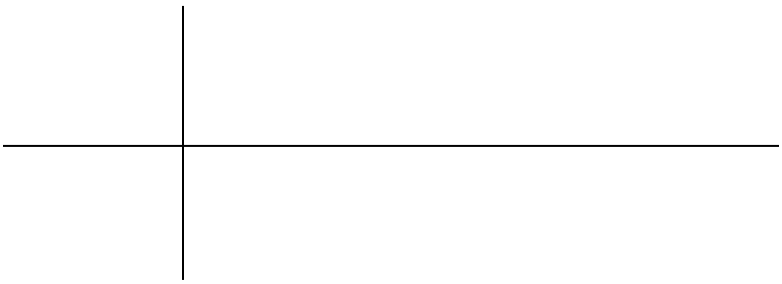
b) Now use this graph as a sketching aide to graph $F(x) = 2\sec(x) + 1$



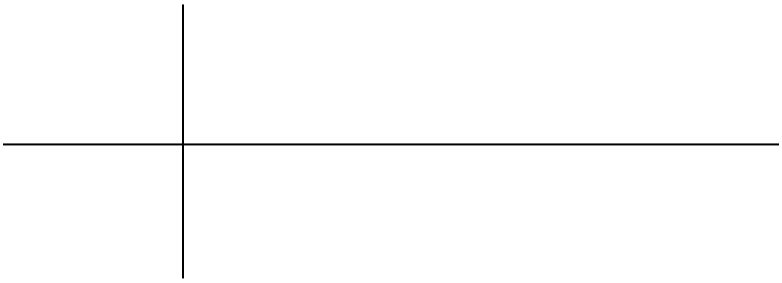
c) Graph $y = \csc(2x - \pi)$



d) Graph $y = \frac{1}{2}\sec(3x)$



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



f) Graph $y = -\csc\left(x - \frac{\pi}{2}\right) + 2$