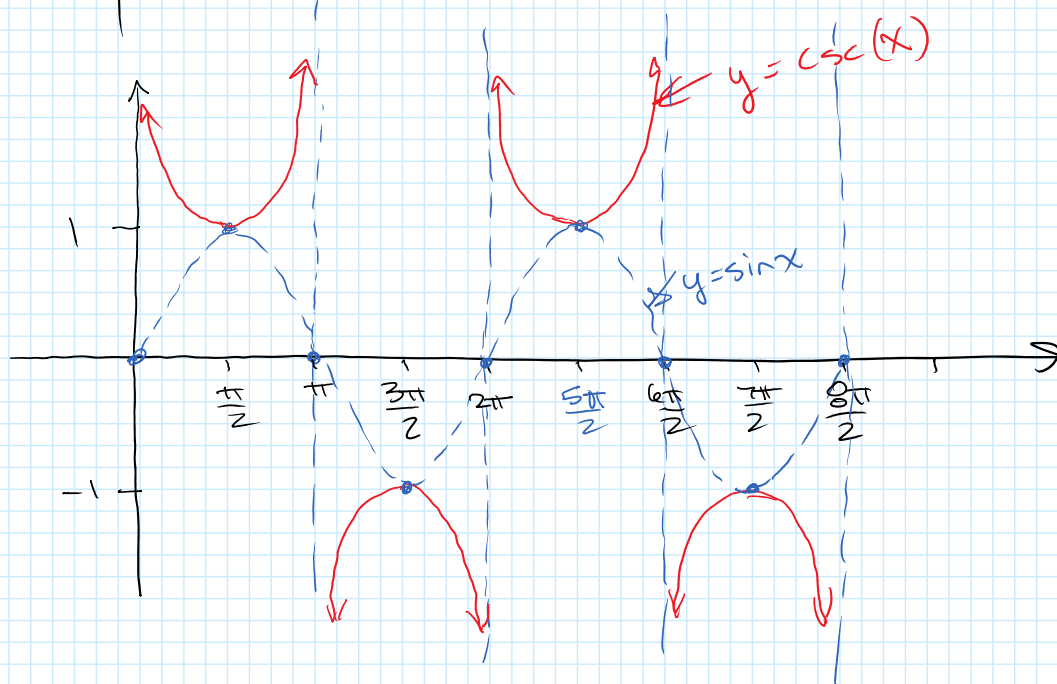
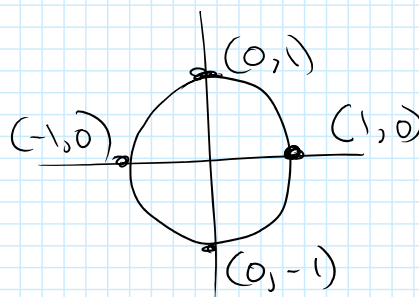


# 4.4: Graphs of the Secant and Cosecant Functions

## Graph of $y = \csc(x)$

$\csc(x)$  is the reciprocal of  $\sin(x)$

| $x$              | $y = \sin x$              | $y = \csc(x)$ |
|------------------|---------------------------|---------------|
| 0                | $\sin(0) = 0$             | undefined     |
| $\frac{\pi}{2}$  | $\sin(\frac{\pi}{2}) = 1$ | 1             |
| $\pi$            | $\sin(\pi) = 0$           | undefined     |
| $\frac{3\pi}{2}$ | -1                        | -1            |
| $2\pi$           | 0                         | undefined     |



Note:  $y = \csc(x)$  is undefined at integer multiples of  $\pi$

Draw vertical asymptotes through all the x-intercepts of  $y = \sin(x)$

The range  $(-\infty, -1] \cup [1, \infty)$

4.4. 2

Ex: Graph  $y = 3 \sec(5x)$ .

1st graph  $y = 3 \cos(5x)$ .

Amplitude: 3  
Period:  $\frac{2\pi}{5}$

