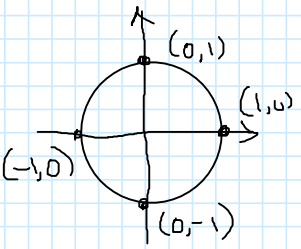
4.4: Graphs of the Secant and Cosecant Functions

Graph of $y = \csc(x)$

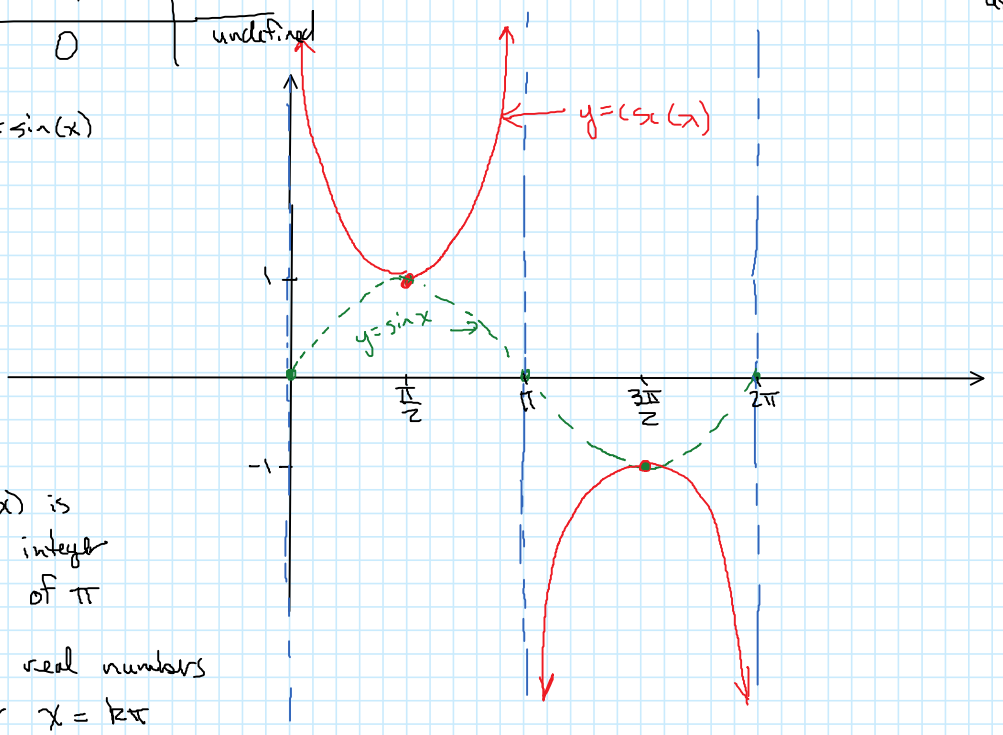
$\csc(x)$ is the reciprocal of $\sin(x)$.



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

Wherever $y = \sin(x)$ has an x-intercept (so $\sin(x) = 0$), $\csc(x)$ is undefined (has a vertical asymptote)

1st graph $y = \sin(x)$



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

Domain: all real numbers except for $x = k\pi$ where k is any integer

Range: of $y = \csc(x)$ is $(-\infty, -1] \cup [1, \infty)$

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

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

Amplitude 3

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