Name Key

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I can graph secant and cosecant functions.

Secant and Cosecant Functions (4.6)

$$y = -2\csc(2x) - 1$$

* treat the function as its inverse trig function's graph: $y = -a\sin(ax) - 1$

new x-values:

$2x = 0$ → $x = 0$

$2x = \frac{\pi}{2}$ → $x = \frac{\pi}{4}$

$2x = \pi$ → $x = \frac{\pi}{2}$

$2x = \frac{3\pi}{2}$ → $x = \frac{3\pi}{4}$

$2x = 2\pi$ → $x = \pi$

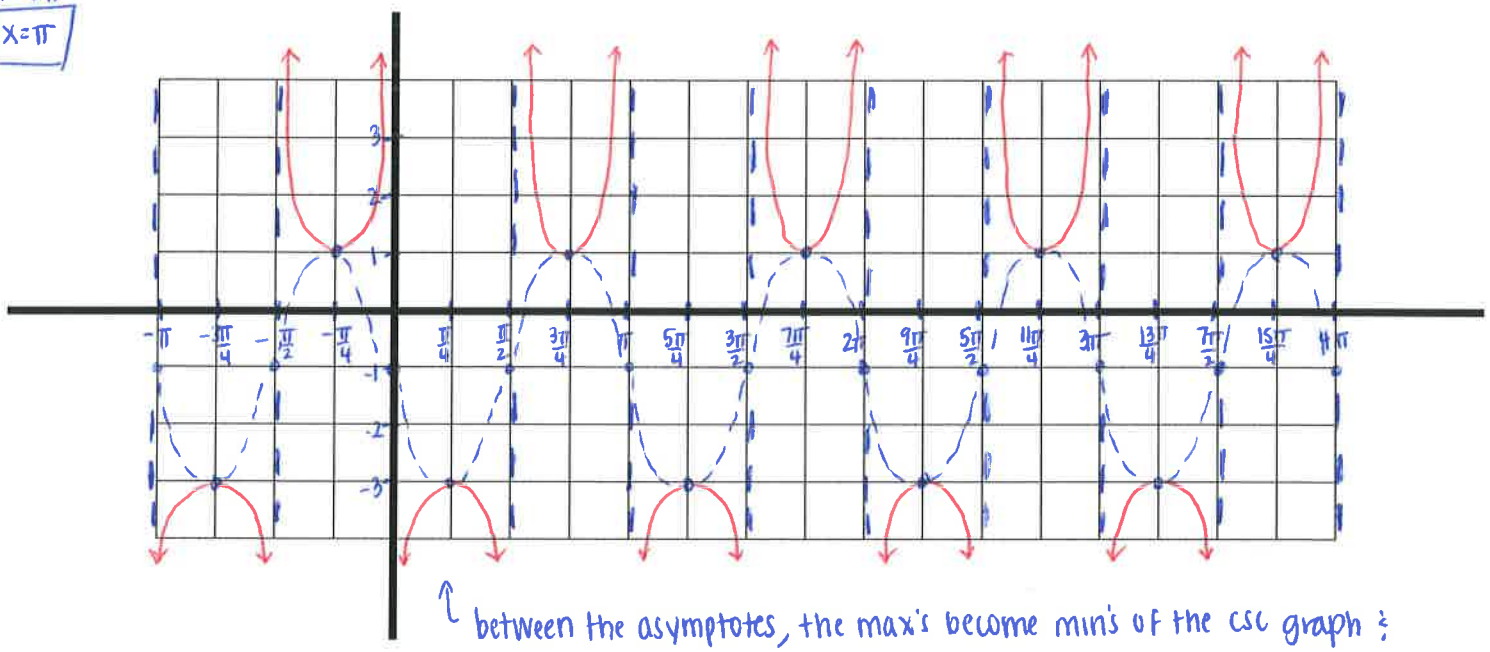
new x	x-axis	y-axis	-2y	-1	
0	0	0	0	-1	← asymptote
$\pi/4$	$\pi/2$	1	-2	-3	
$\pi/2$	π	0	0	-1	← asymptote
$3\pi/4$	$3\pi/2$	-1	2	1	
π	2π	0	0	-1	← asymptote

at 0: (1,0) $\sin 0 = 0 \Rightarrow \csc\theta = \frac{1}{0} = \text{und}$

at π: (-1,0) $\sin\pi = 0 \Rightarrow \csc\theta = \frac{1}{0} = \text{und}$

at 2π: (1,0) $\sin(2\pi) = 0 \Rightarrow \csc\theta = \frac{1}{0} = \text{und}$

} wherever orig. sine value is 0, csc is und. so asymptote



between the asymptotes, the max's become min's of the csc graph & min's become max's of the csc graph

$$y = \frac{1}{2}\sec(2x-\pi)+1 \Rightarrow \frac{1}{2}\cos(2x-\pi)+1$$

$2x-\pi=0$
$2x=\pi$
$\boxed{x=\pi/2}$

$2x-\pi=\pi$
$2x=2\pi$
$\boxed{x=\pi}$

$2x-\pi=\frac{\pi}{2}$
$2x=\frac{3\pi}{2}$
$\boxed{x=\frac{3\pi}{4}}$

$2x-\pi=2\pi$
$2x=3\pi$
$\boxed{x=\frac{3\pi}{2}}$

$2x-\pi=\frac{3\pi}{2}$
$2x=\frac{5\pi}{2}$
$\boxed{x=\frac{5\pi}{4}}$

$2x-\pi=3\pi$
$2x=4\pi$
$\boxed{x=2\pi}$

new x	x-axis	y-axis	$\frac{1}{2}y$	+1	
$\pi/2$	0	1	0.5	1.5	
$3\pi/4$	$\pi/2$	0	0	1	← asymptote
π	π	-1	-0.5	0.5	
$5\pi/4$	$3\pi/2$	0	0	1	← asymptote
$3\pi/2$	2π	1	0.5	1.5	

at $\frac{\pi}{2}$: $(0,1)$: $\cos(\frac{\pi}{2})=0 \Rightarrow \sec(\frac{\pi}{2})=\frac{1}{0}=$ und

at $\frac{3\pi}{2}$: $(0,-1)$: $\cos(\frac{3\pi}{2})=0 \Rightarrow \sec(\frac{5\pi}{2})=\frac{1}{0}=$ und

⟩ wherever orig. cos value is 0, sec is und. so asymptote