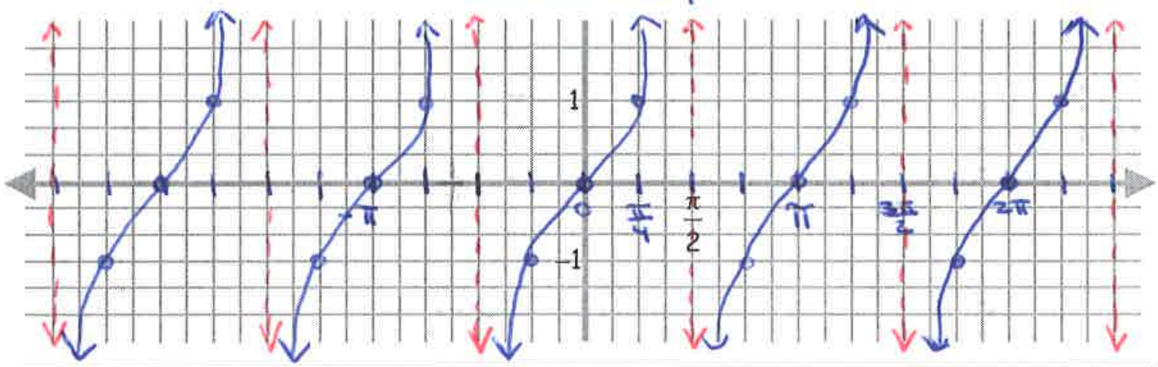
Precalculus Name Key

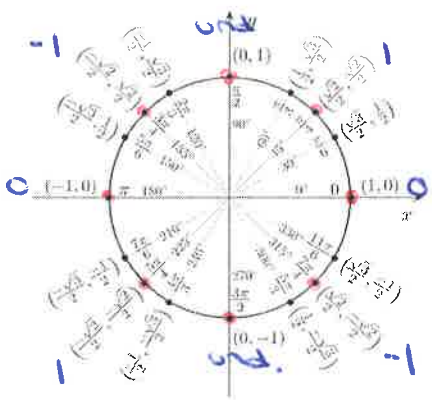
x	y
$-\frac{3\pi}{2}$	und.
$-\frac{5\pi}{4}$	-1
$-\pi$	0
$-\frac{3\pi}{4}$	1
$-\frac{\pi}{2}$	und.
$-\frac{\pi}{4}$	-1
0	0
$\frac{\pi}{4}$	1
$\frac{\pi}{2}$	und.
$\frac{3\pi}{4}$	-1
π	0
$\frac{5\pi}{4}$	1
$\frac{3\pi}{2}$	und.

$y = \tan(x)$

π is 1 Period



Domain: $\mathbb{R}$ except $x = \frac{\pi}{2} + n\pi$ where n is an integer ($n \in \mathbb{Z}$)	Range: $(-\infty, \infty)$	Period: π

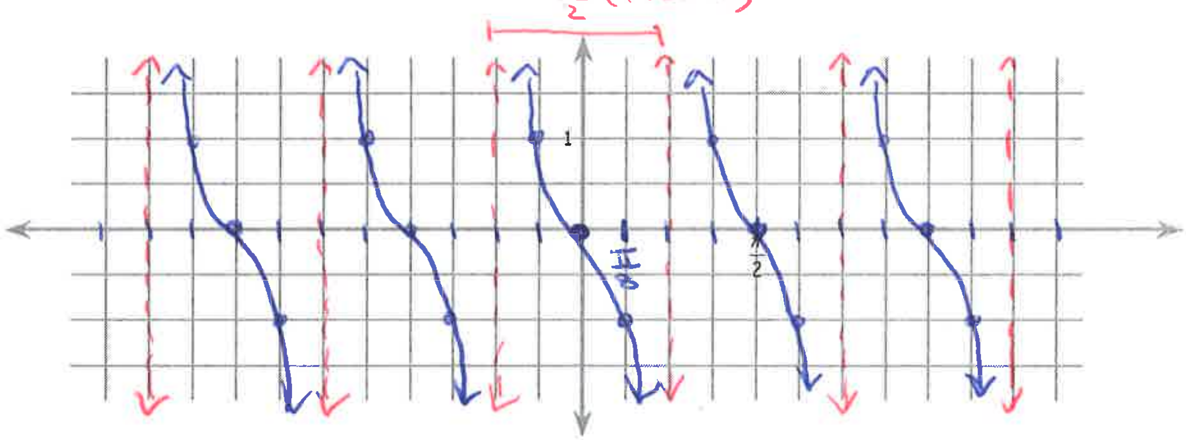


- When determining the domain, consider the fact that there are undefined values that occur at a regular interval. Figure out where the first undefined value is and then how often these undefined values occur.
- Notice that there are still "**important values,**" however they occur every $\frac{\pi}{4}$ radians.
- Instead of having relative extrema and intercepts, there are x-intercepts, asymptotes, or points that show the vertical stretch.
- You can still find the important values by dividing the period by 4.
- Note there is not amplitude, because this is not a sinusoidal (wave) graph.

$\tan\theta = \frac{\sin\theta}{\cos\theta}$

1. $y = -\tan(2\theta)$

$\frac{\pi}{2}$ (1 Period)



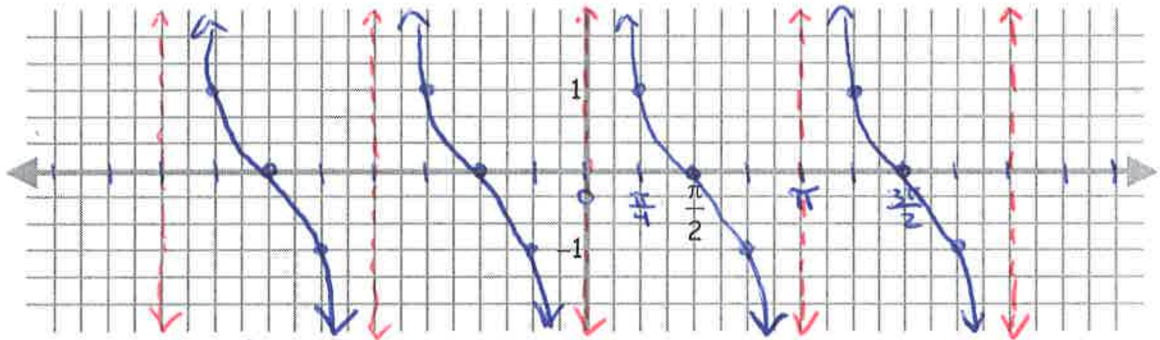
Amplitude: NONE *There is only an amplitude for sinusoidal functions*	Phase Shift: 0	Important Values: $\frac{\pi}{2} \div 4 = \frac{\pi}{2} \cdot \frac{1}{4} = \frac{\pi}{8}$
Period: $\frac{\pi}{b} = \frac{\pi}{2}$	Vertical Shift: 0	Reflection? Yes * function will decrease

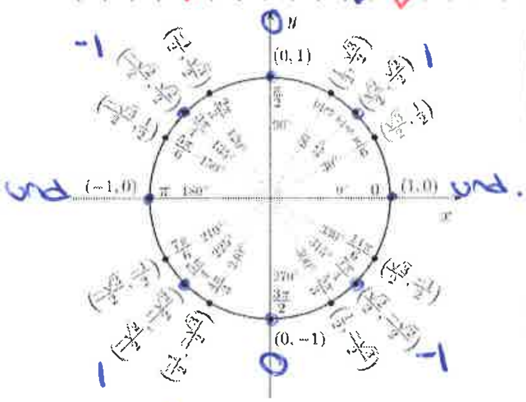
* every intersection occurs every $\frac{\pi}{2}$ Radians

x	y
$-\frac{3\pi}{2}$	0
$-\frac{5\pi}{4}$	-1
$-\pi$	und.
$-\frac{3\pi}{4}$	1
$-\frac{\pi}{2}$	0
$-\frac{\pi}{4}$	-1
0	und.
$\frac{\pi}{4}$	1
$\frac{\pi}{2}$	0
$\frac{3\pi}{4}$	-1
π	und.
$\frac{5\pi}{4}$	1
$\frac{3\pi}{2}$	0

$y = \cot(x)$

$y = \frac{1}{\tan(x)}$



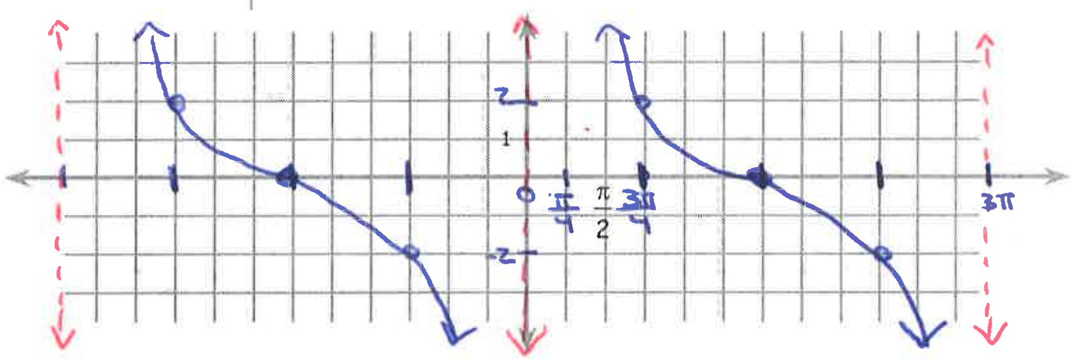


Domain: $\mathbb{R}$ except $x = n\pi$ where n is an integer	
Range: $(-\infty, \infty)$	Period π

2. $y = 2\cot\left(\frac{x}{3}\right)$

* Horizontal Stretch

* Vertical Stretch

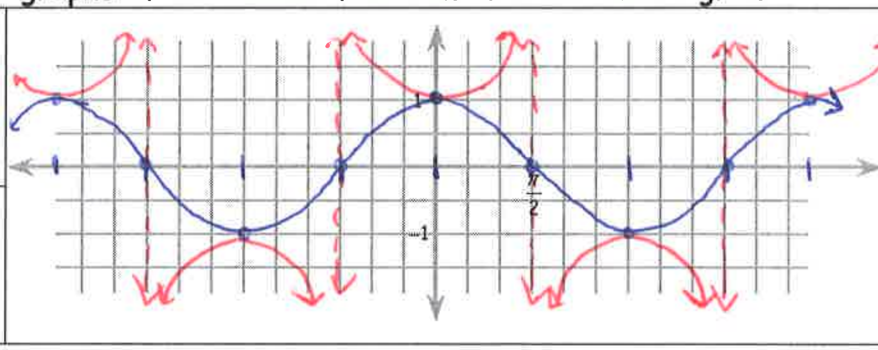


Amplitude: NONE *There is only an amplitude for sinusoidal functions*	Phase Shift: 0	Important Values: $\frac{3\pi}{4}$
Period: $\frac{\pi}{\frac{1}{3}} = 3\pi$	Vertical Shift: 0	Reflection? no; function decreases like the parent

Precalculus Name Key

When the sine is equal to zero, the cosecant is undefined and there will be an asymptote on the graph. Likewise, when the cosine is equal to zero, the secant is undefined and there will be an asymptote on the graph.

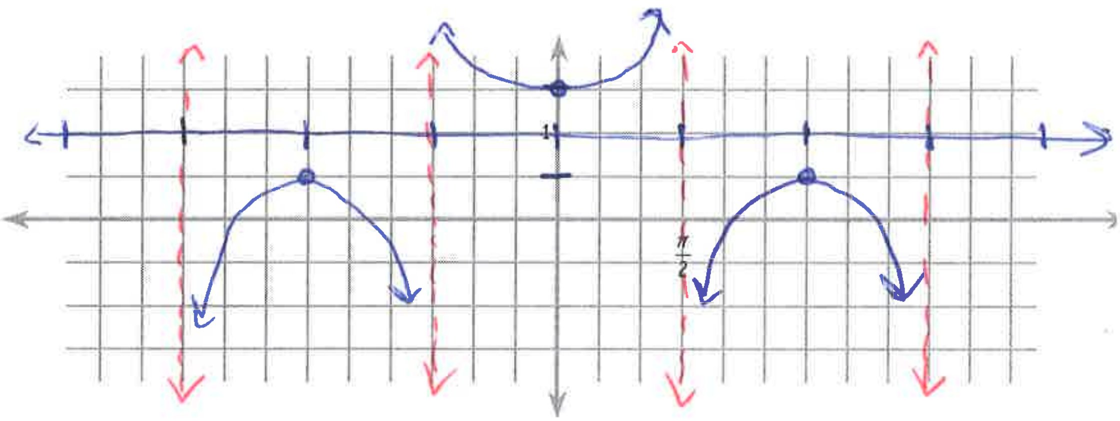
Graph the "important values" of the cosine function on the graph below and use these values to build the parent graphs of the secant function. Fill the entire grid.

$f(x) = \cos x$ Graph only the "important values"		$f(x) = \sec(x)$
		Domain: $\mathbb{R}$, except $x = \frac{\pi}{2} + n\pi$
$f(x) = \sec x$		Range: $(-\infty, -1] \cup [1, \infty)$
		Period: 2π

| Period is 2π

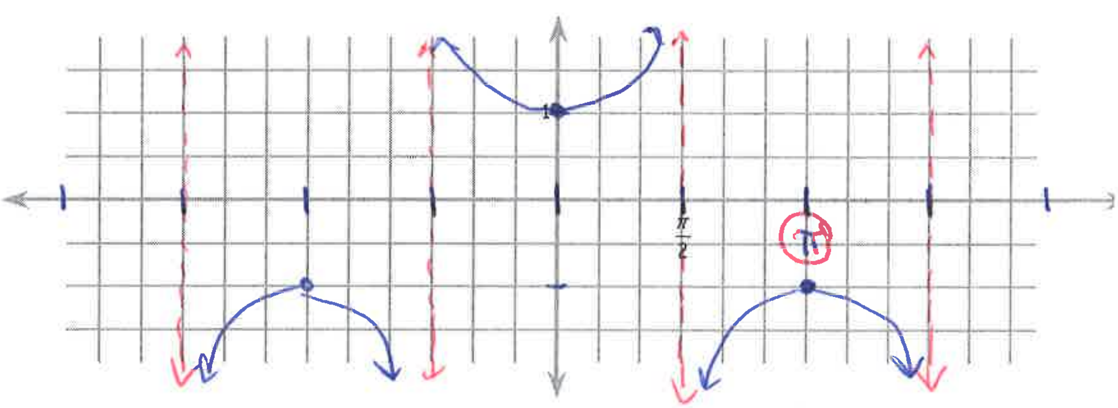
1. $y = \frac{1}{2}\sec x + 1$

Amplitude:	Reflection?
NONE N/A	none
Period: 2π	**Important Values:** $\frac{\pi}{2}$
Phase Shift: 0	**Vertical Shift:** up 1

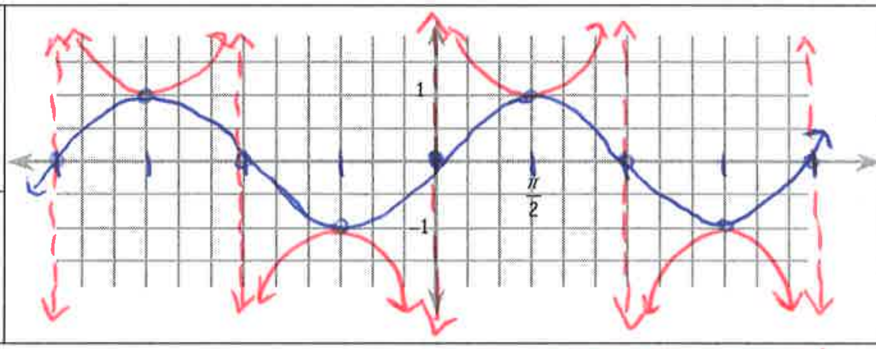


2. $y = -\sec(x - \pi)$

Amplitude:	Reflection?
None N/A	yes
Period: 2π	**Important Values:** $\frac{\pi}{2}$
Phase Shift: π	**Vertical Shift:** 0



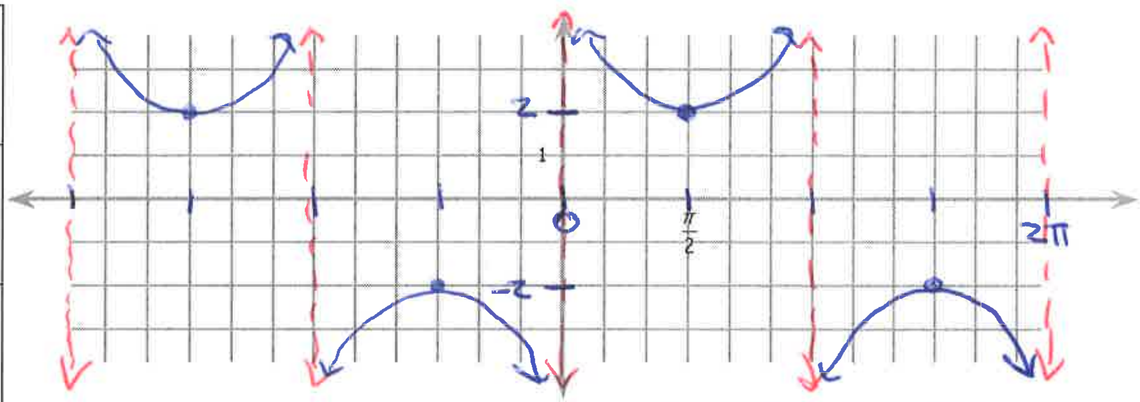
* Same graph as the parent function

$f(x) = \sin x$ Graph only the "important values"		$f(x) = \csc(x)$	
$f(x) = \csc x$		Domain: $\mathbb{R}$, except $x = \pi n$ Range: $(-\infty, -1] \cup [1, \infty)$ Period: 2π	

1 Period = 2π

3. $y = 2\csc x$

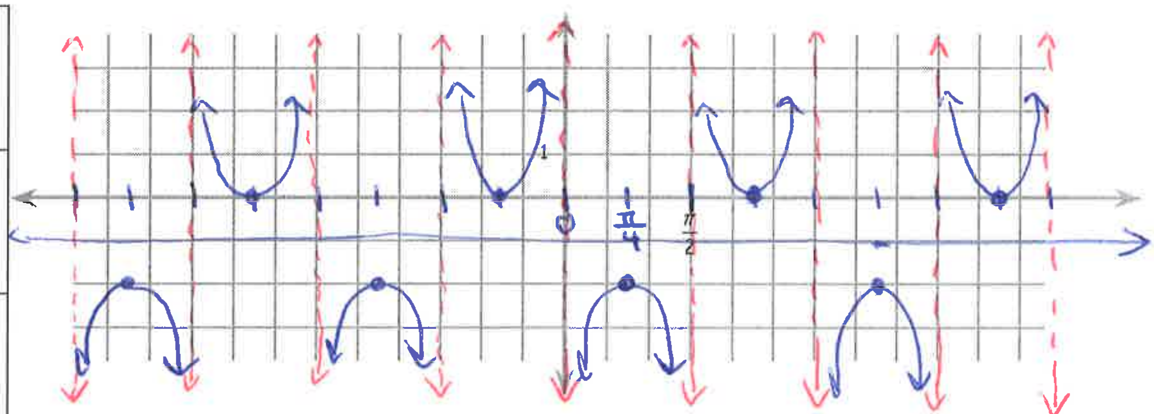
Amplitude: NONE N/A	Reflection? none
Period: 2π	Important Values: $\frac{\pi}{2}$
Phase Shift: 0	Vertical Shift: 0



1 Per = 2π

4. $y = -\csc 2x - 1$

Amplitude: None/ N/A	Reflection? yes
Period: π	Important Values: $\frac{\pi}{4}$
Phase Shift: 0	Vertical Shift: down 1



1 Period = π