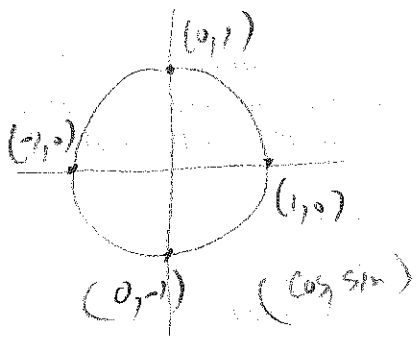
Section 4.6 (Day 1) – Graphs of Secant & Cosecant Functions

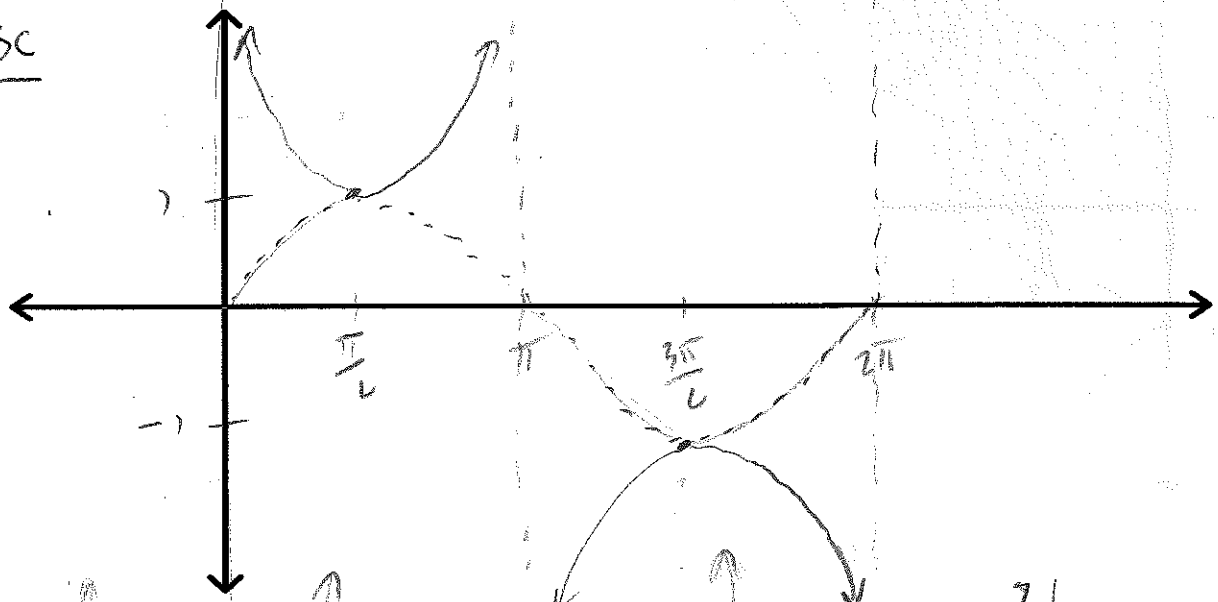
Where do they come from?? Let's look back at that chart from 4.4:

	θ	sinθ	cosθ	cscθ	secθ
	0°	0	1	und	1
$\frac{\pi}{2}$	90°	1	0	1	und
π	180°	0	-1	und	-1
$\frac{3\pi}{2}$	270°	-1	0	-1	und

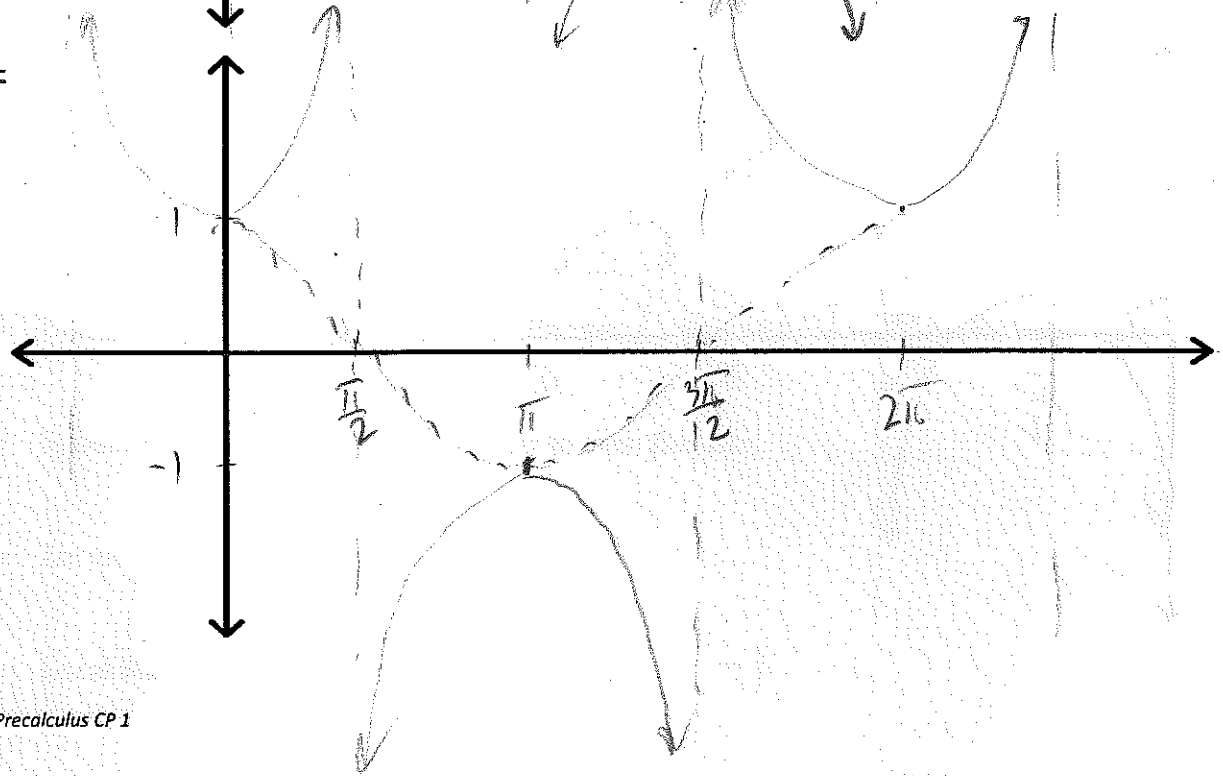


Now let's graph these key points on a coordinate plane:

Csc



Sec

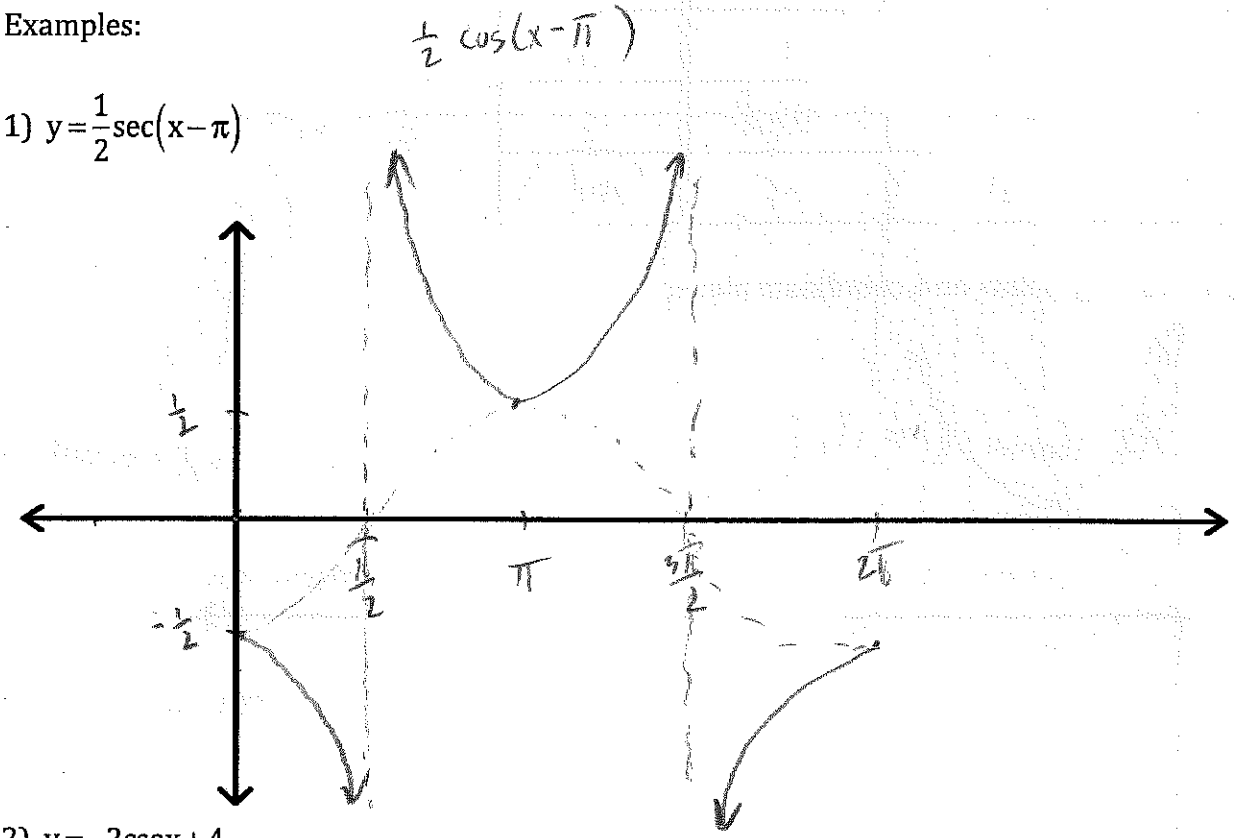


How to graph secant and cosecant

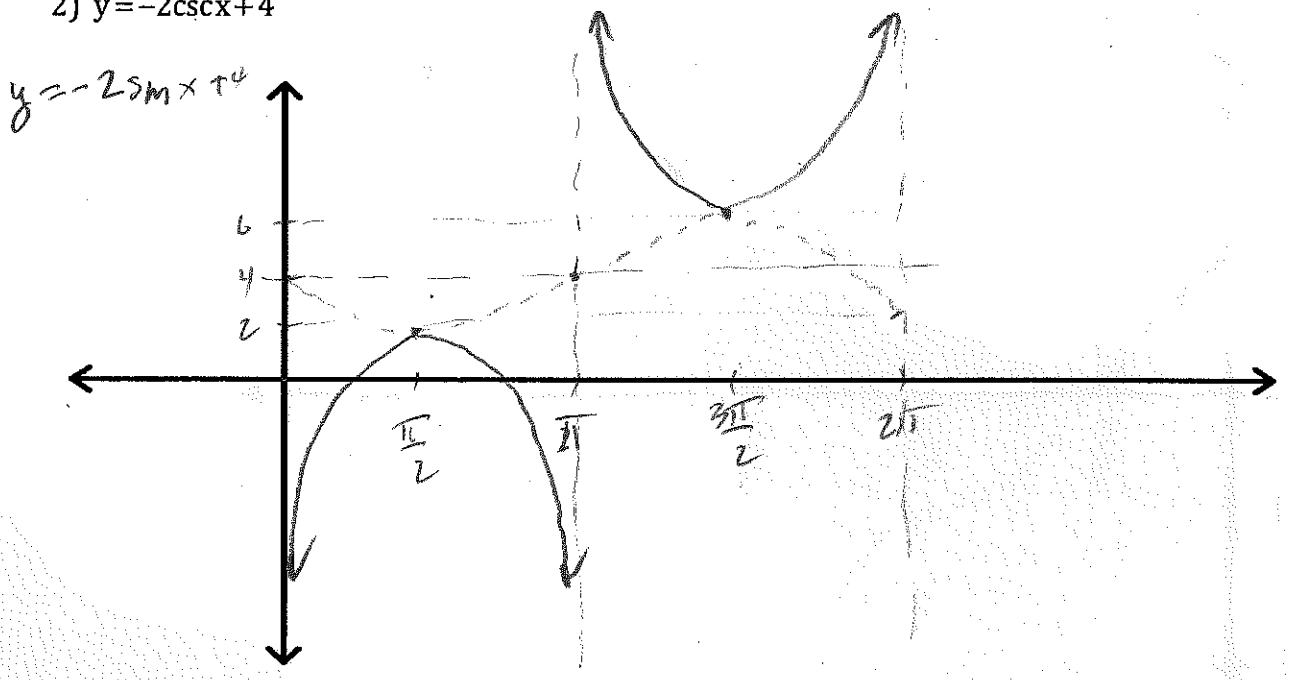
Secant is associated with cosine, and *cosecant* is associated with sine. They will have the same period, frequency and asymptote, so you can graph the sine or cosine graph FIRST, and then use it as a guide to help you graph secant or cosecant.

Examples:

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



2) $y=-2\csc x+4$



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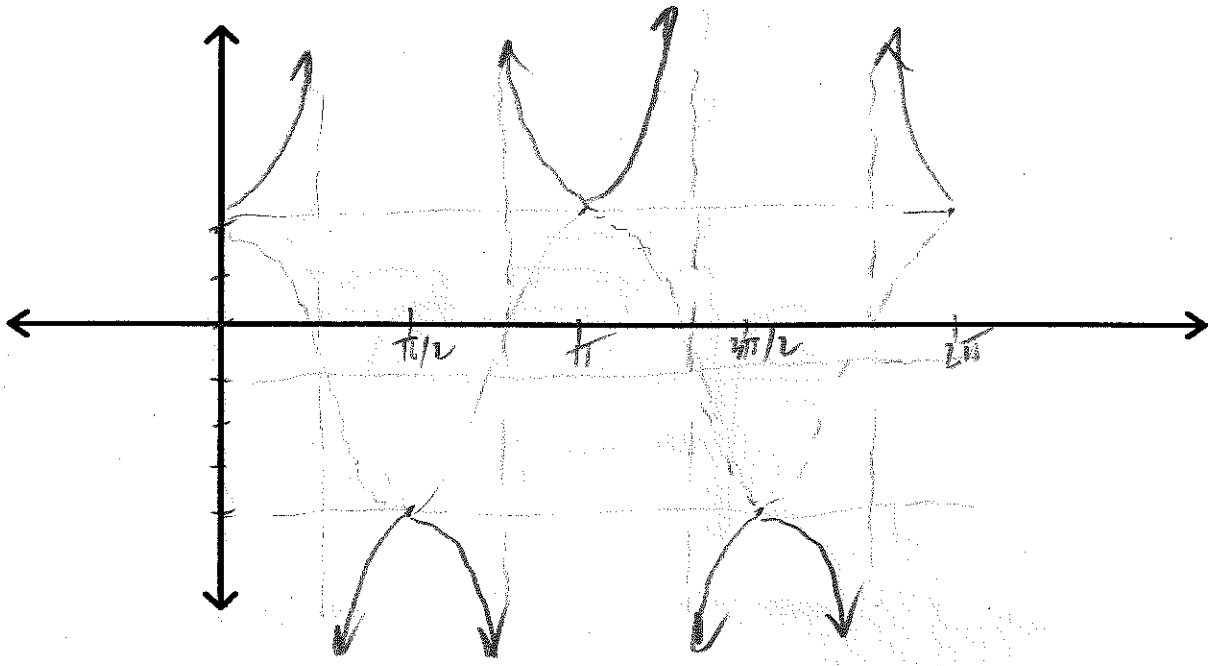
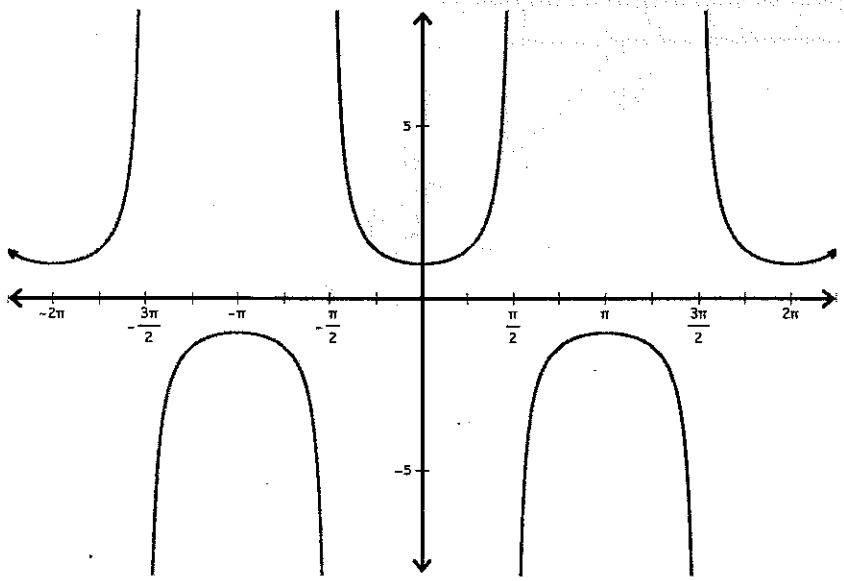
3) $y = 3\sec 2x - 1$

$y = 3\cos(2x - 1)$ $\quad$ amp $= \frac{3}{2}$ $\quad$ period $= \frac{2\pi}{2} = \pi$



Secant Curve



- Domain: $\{x \mid x \neq \frac{\pi}{2} + n\pi\}$ Range: $(-\infty, -1] \cup [1, \infty)$ Period: 2π
- Symmetric with respect to the: *y-axis* so *even function.*
- Zeros: none
- Local Max: 1 Local Min: -1

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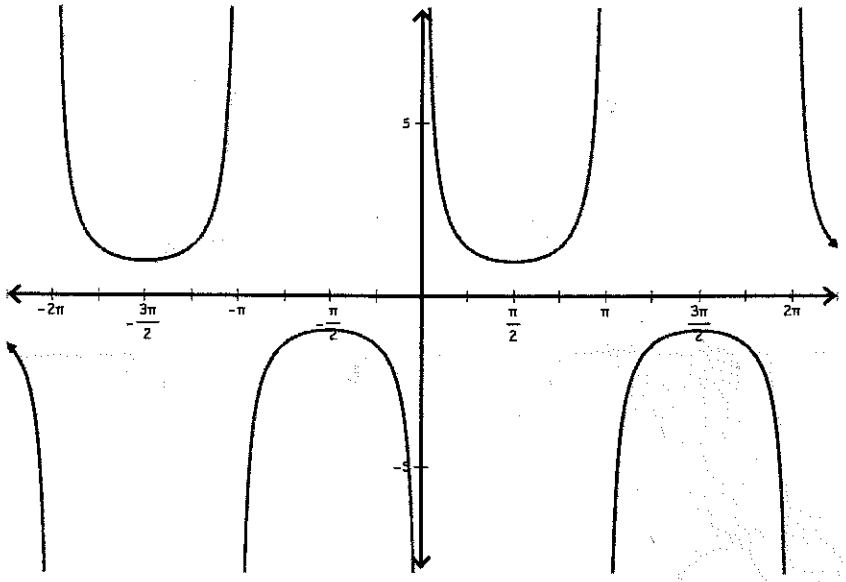
Cosecant Curve



- Domain: $\{x \mid x \neq n\pi\}$ Range: $(-\infty,-1] \cup [1,\infty)$ Period: 2π
- Symmetric with respect to the: *origin* so *an odd function* $(\csc(-x) = -\csc x)$.
- Zeros: none
- Local Max:) Local Min: –)