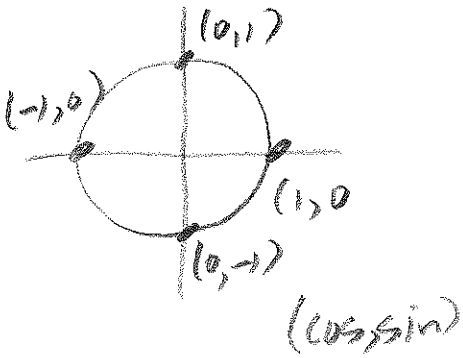
Section 4.6 (Day 1) – Graphs of Secant & Cosecant Functions

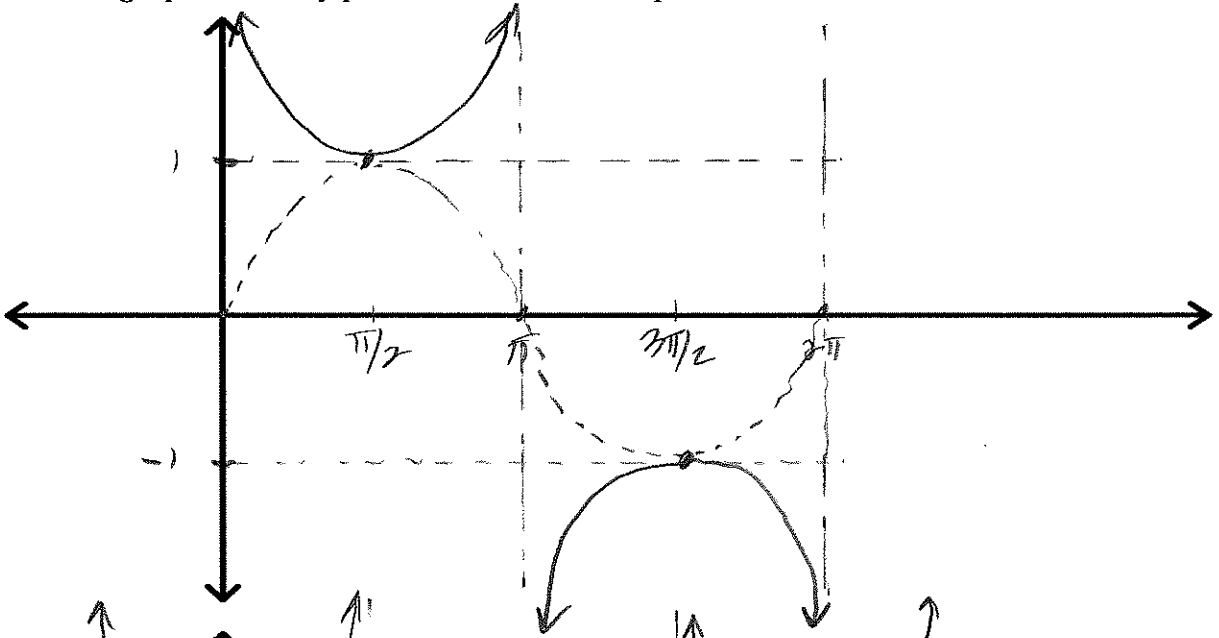
Where do they come from?? Let's look back at that chart from 4.4:

θ	sinθ	cosθ	cscθ	secθ
0	0	1	und	1
$\pi/2$	1	0	1	und
π	0	-1	und	-1
$3\pi/2$	-1	0	-1	und

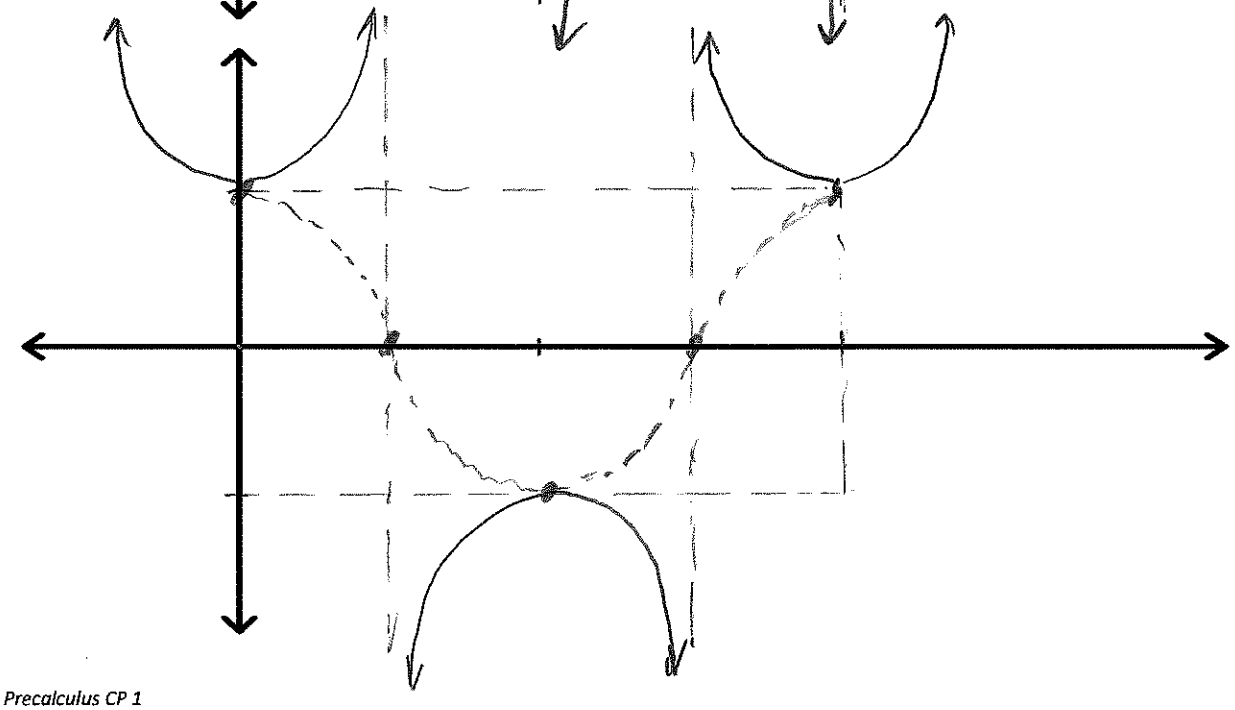


Now let's graph these key points on a coordinate plane:

csc



sec



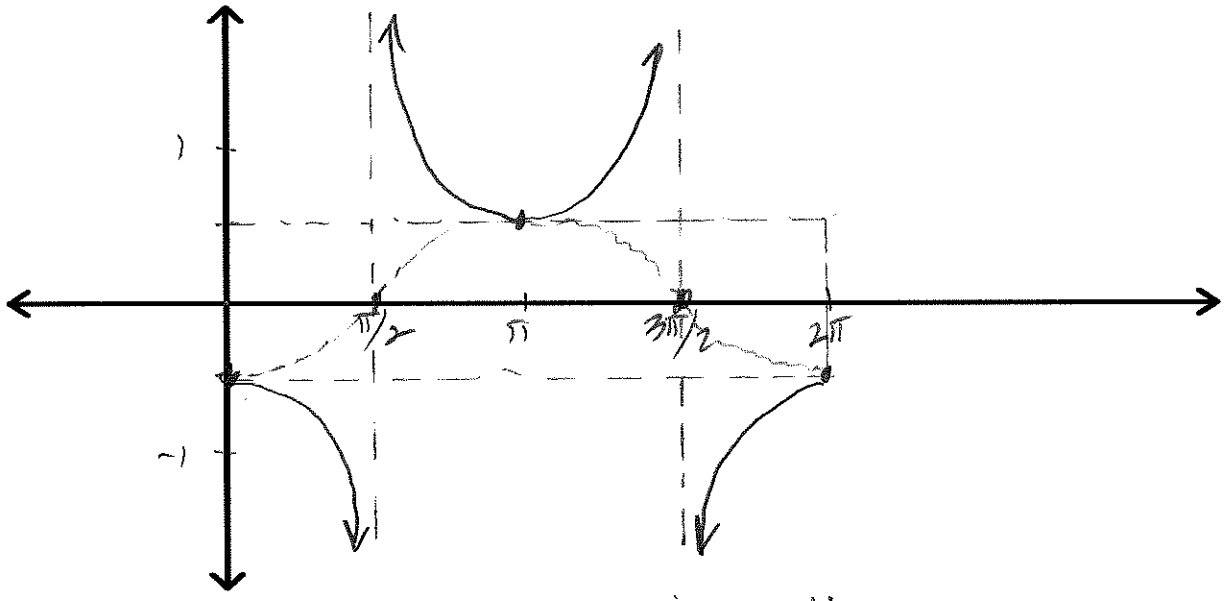
Section 4.6 (Day 1) – Graphs of Secant & Cosecant Functions

How to graph secant and cosecant

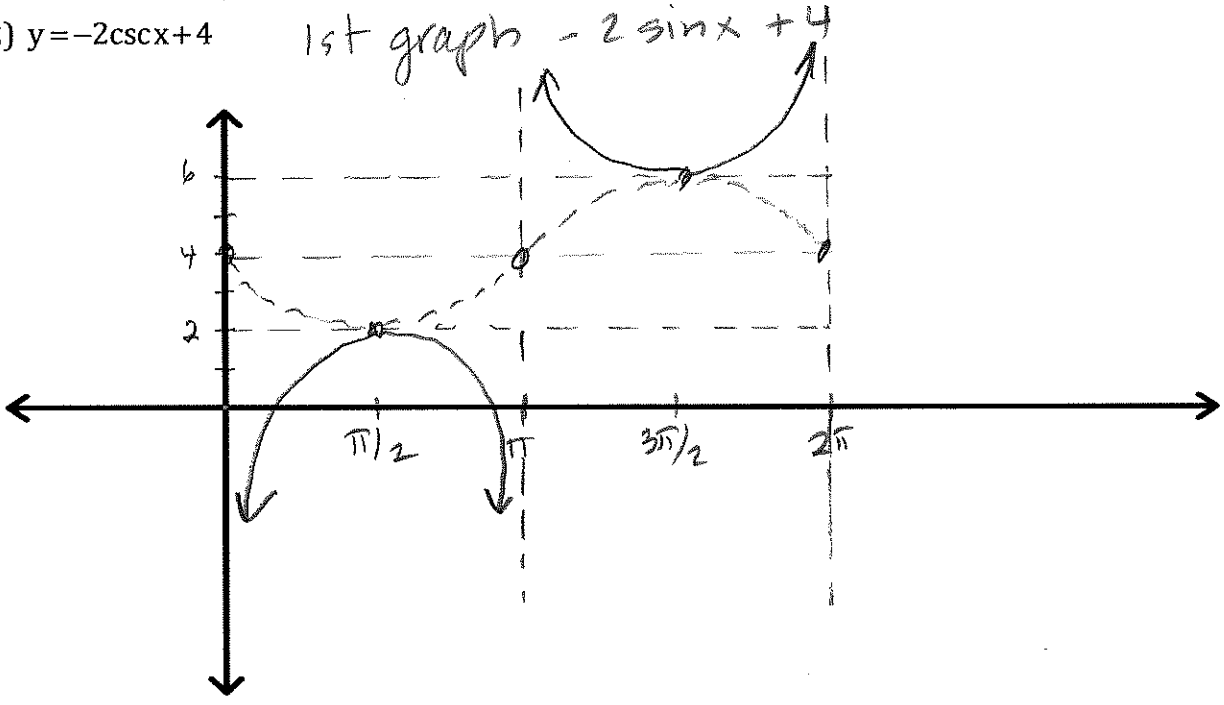
Secant is associated with cosine, and *cosecant* is associated with sine. They will have the same period, frequency and asymptote, so you can graph the sine or cosine graph FIRST, and then use it as a guide to help you graph secant or cosecant.

Examples:

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

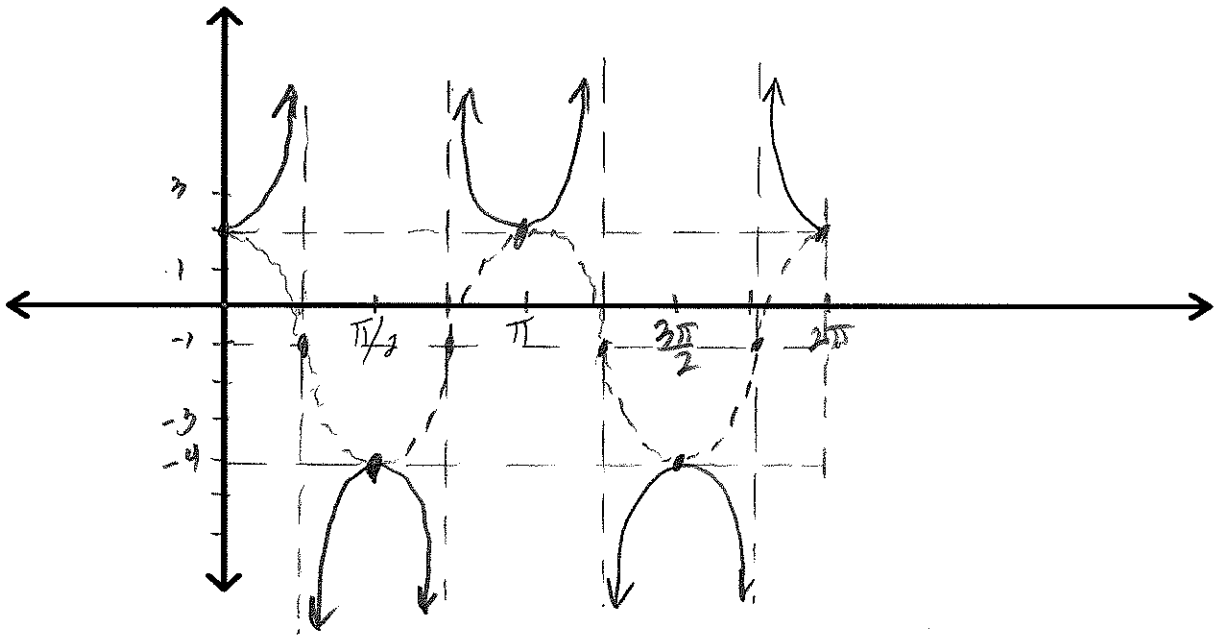


2) $y=-2\csc x+4$ 1st graph $-2\sin x+4$

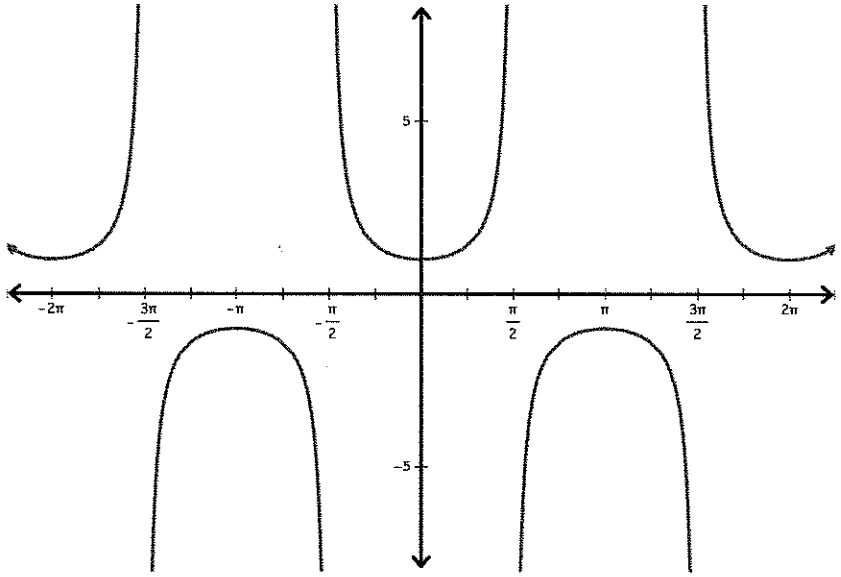


Section 4.6 (Day 1) – Graphs of Secant & Cosecant Functions

3) $y = 3\sec 2x - 1$ 1st graph $3\cos 2x$ $P = \frac{2\pi}{2} = \pi$ CP every $\frac{\pi}{4}$



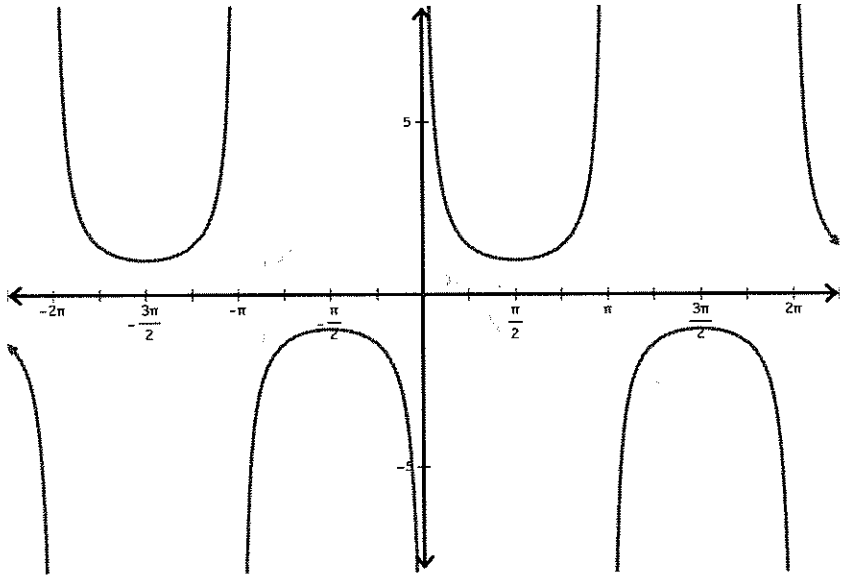
Secant Curve



- 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:) Local Min: ~)

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

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: –)

Homework: p. 339, #12, 14, 17, 21, 27, 29.