Trig 6.7 tan / cot

Graph secant and cosecant
Write equations of trig functions

secant cos = 0 undef

cosecant sin = 0 undef

reciprocal

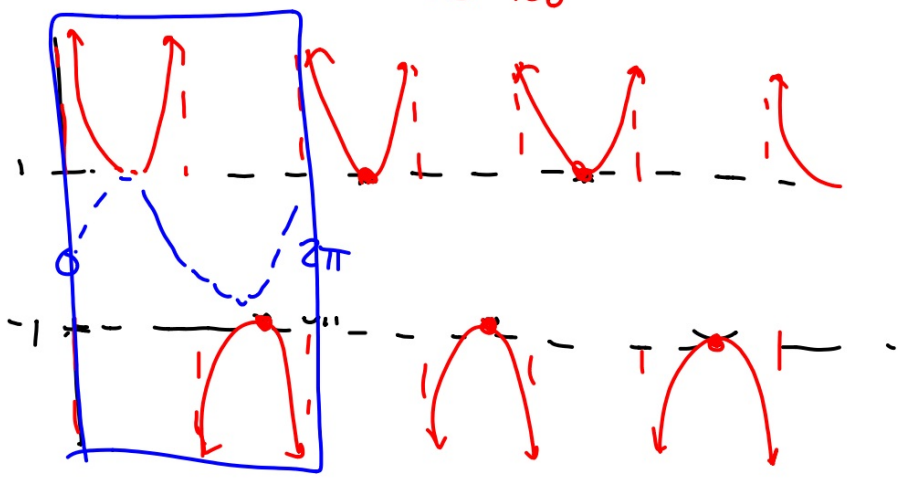
asymptote

Just fell asleep at the beach and woke up with a hideous tan line

100 10

$y = \csc x$ -10 -100

$\frac{1}{100}$ $\frac{1}{10}$ Parent graph: y= sinx $\frac{-1}{10}$ $\frac{-1}{100}$



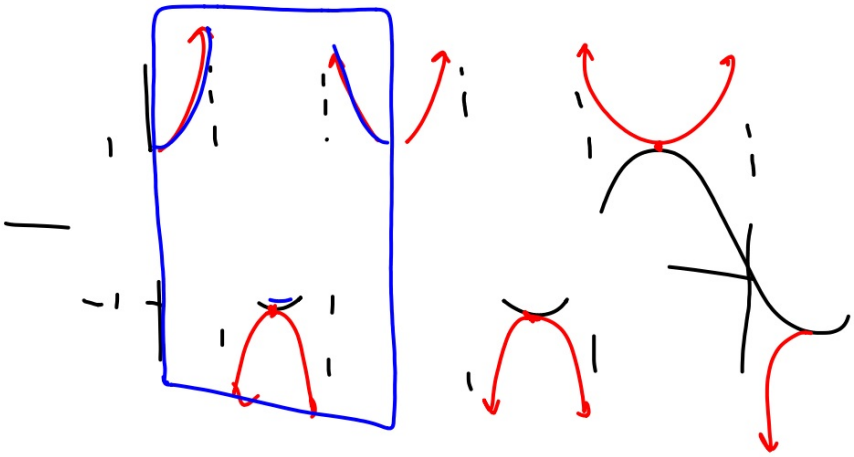
Where sine has a zero...
Also: what is the reciprocal of one?

Properties of the Graph of $y = \csc x$

1. The period is 2π.
2. The domain is the set of real numbers except πn, where n is an integer.
3. The range is the set of real numbers greater than or equal to 1 or less than or equal to -1.
4. There are no x-intercepts.
5. There are no y-intercepts.
6. The asymptotes are $x = \pi n$, where n is an integer.
7. $y = 1$ when $x = \frac{\pi}{2} + 2\pi n$, where n is an integer.
8. $y = -1$ when $x = \frac{3\pi}{2} + 2\pi n$, where n is an integer.

p. 397

Where cos has a zero...
What is the reciprocal of one?



p. 397

Properties of the Graph of $y = \sec x$	1. The period is 2π. 2. The domain is the set of real numbers except $\frac{\pi}{2}n$, where n is an odd integer. 3. The range is the set of real numbers greater than or equal to 1 or less than or equal to -1. 4. There are no x-intercepts. 5. The y-intercept is 1. 6. The asymptotes are $x = \frac{\pi}{2}n$, where n is an odd integer. 7. $y = 1$ when $x = \pi n$, where n is an even integer. 8. $y = -1$ when $x = \pi n$, where n is an odd integer.

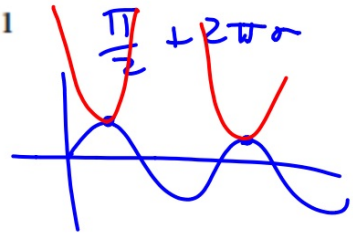
What is the reciprocal of 1?

2 **Find the values of θ for which each equation is true.**

$\frac{1}{\sin\theta}$

a. $\csc\theta = 1$

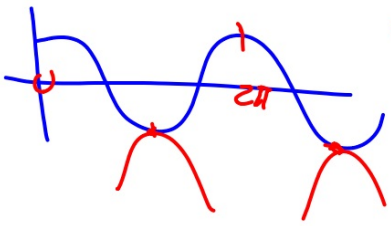
$\frac{\pi}{2} + 2\pi n$



$\frac{1}{\cos}$

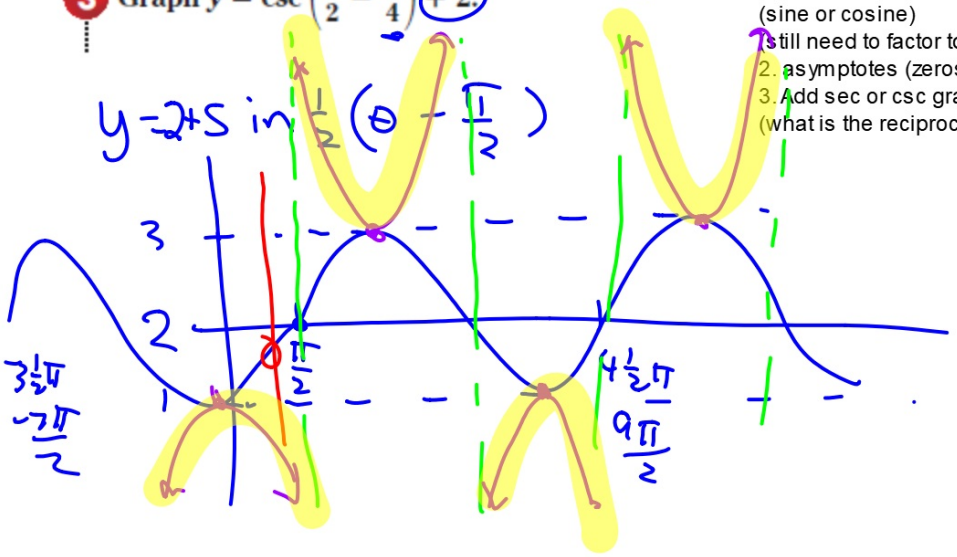
b. $\sec\theta = -1$

$\pi + 2\pi n$



$\frac{1}{2}\left(\theta - \frac{\pi}{2}\right)$ $\frac{2}{1/2}\frac{2\pi}{} = 4\pi$

3 Graph $y = \csc\left(\frac{\theta}{2} - \frac{\pi}{4}\right) + 2.$



1. Graph the corresponding parent graph (sine or cosine)
(still need to factor to see period & phase shift, etc.)
2. asymptotes (zeros)
3. Add sec or csc graphs
(what is the reciprocal of 1?)

5 Write an equation for a secant function with period π, phase shift $\frac{\pi}{3}$, and vertical shift -3.

$y = -3 + \sec 2\left(\theta - \frac{\pi}{3}\right)$

$\frac{2\pi}{n} = \pi$

$\frac{\pi n}{\pi} = \frac{2\pi}{\pi}$