Trig 6.7

$\frac{2\pi}{n}$ = per  sin & cos

Graph secant and cosecant
Write equations of trig functions

secant $= \frac{1}{\cos}$

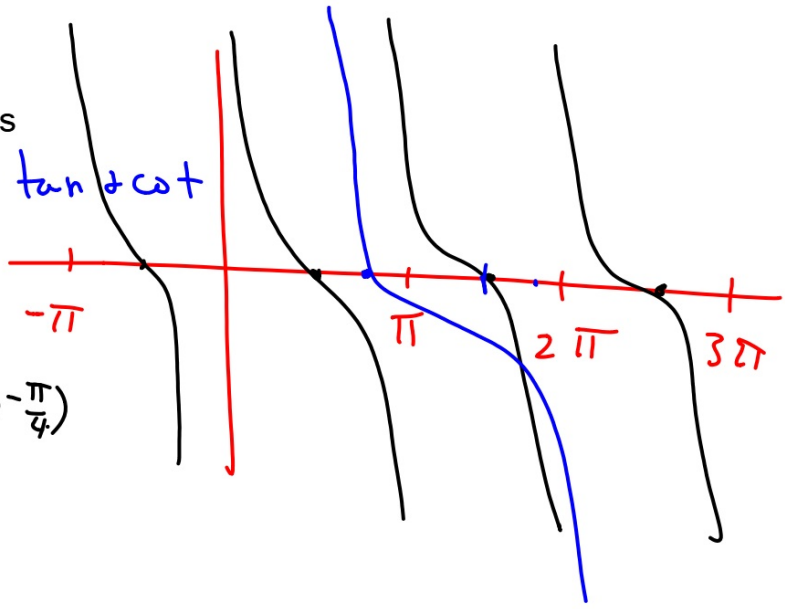
cosecant $\frac{1}{\sin}$

$\frac{\pi}{n}$ = per  tan & cot

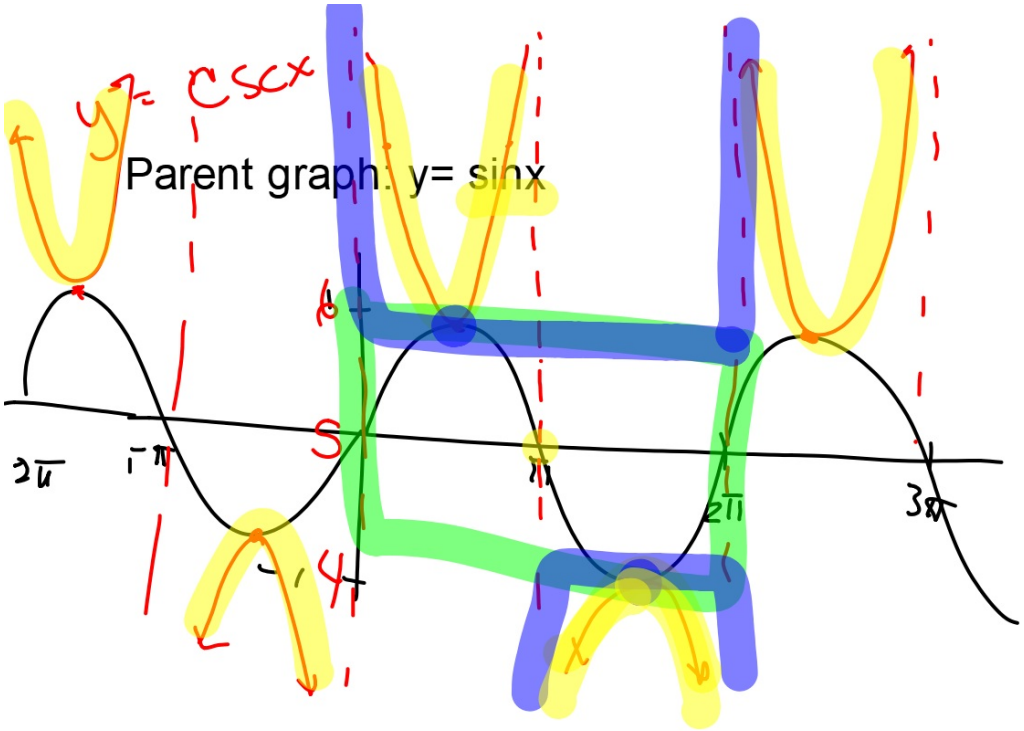
reciprocal

asymptote

$y = 2\cot(\theta - \frac{\pi}{4})$



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

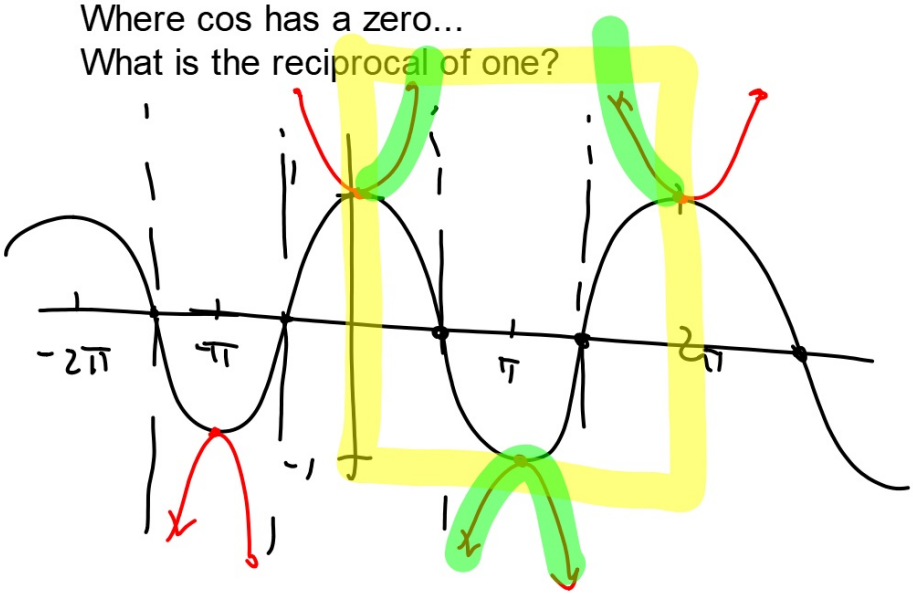

y = csc x
Parent graph: y= sinx
1
S
-1
2π
-π
π
2π
3π

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

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

1. The period is $2\pi$.
2. The domain is the set of real numbers except $\pi n$, 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.

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



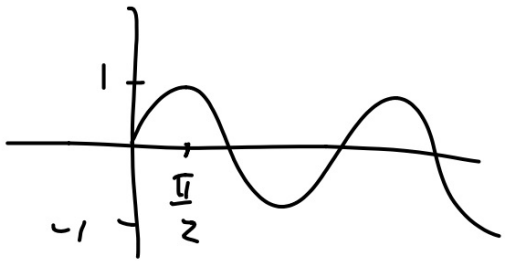
| | |
|---|---|
| **Properties of the Graph of $y = \sec x$** | 1. The period is $2\pi$.<br>2. The domain is the set of real numbers except $\frac{\pi}{2}n$, where $n$ is an odd integer.<br>3. The range is the set of real numbers greater than or equal to 1 or less than or equal to $-1$.<br>4. There are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

What is the reciprocal of 1?

**2** **Find the values of $\theta$ for which each equation is true.**

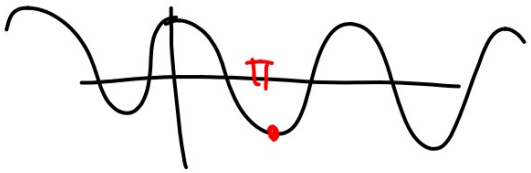
a. $\csc\theta = 1$

$\sin\theta = 1$

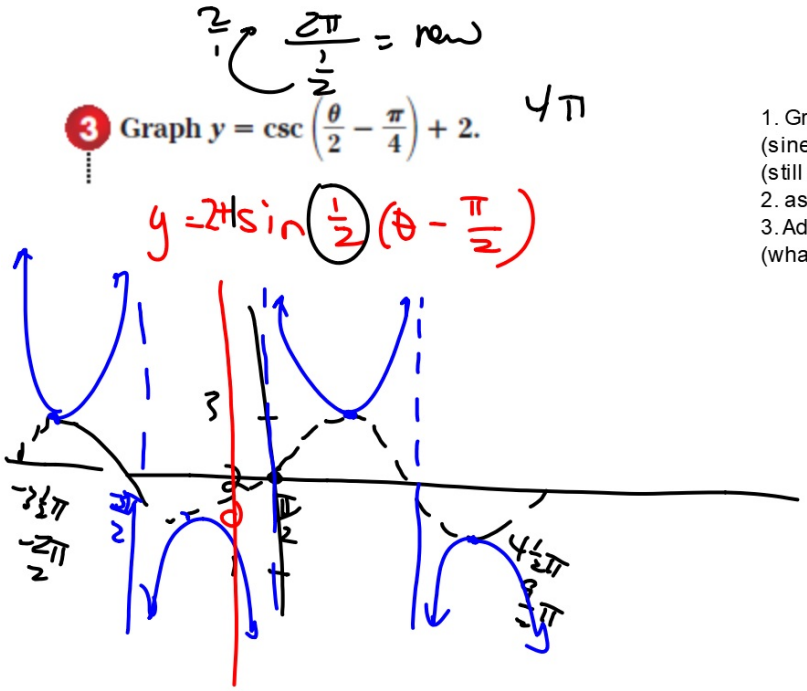



b. $\sec\theta = -1$

$\cos\theta = -1$



**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?)

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

$$\pi n = 2\pi$$

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

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

$$\sec = \frac{1}{\cos}$$