Graphs of the Other Trigonometric Functions

Recall the definitions of the "other trig functions":

DEFINITIONS: The **tangent function** is defined by $\boxed{\tan(t) = \dfrac{\sin(t)}{\cos(t)}}$.

The **cotangent function** is defined by $\cot(t) = \dfrac{1}{\tan(t)}$.

Consequently: $\cot(t) = \dfrac{\cos(t)}{\sin(t)}$

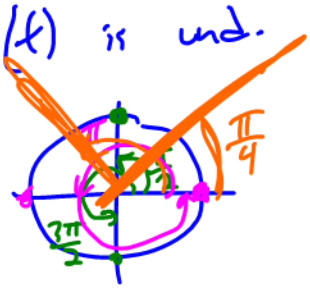
The **secant function** is defined by $\sec(t) = \dfrac{1}{\cos(t)}$.

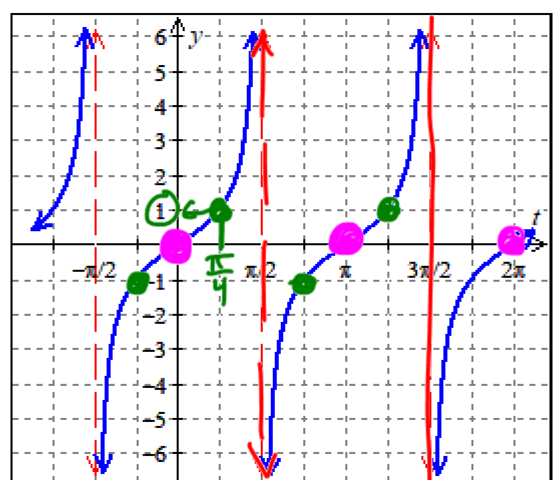
The **cosecant function** is defined by $\csc(t) = \dfrac{1}{\sin(t)}$.

Below is the graph $y = \tan(t)$. Let's discuss why the graph looks like it does.

$y = \tan(t) = \boxed{\dfrac{\sin(t)}{\cos(t)}}$

Since tangent involves division, tangent has "problems" where $\cos(t) = 0$, $\tan(t)$ is und.





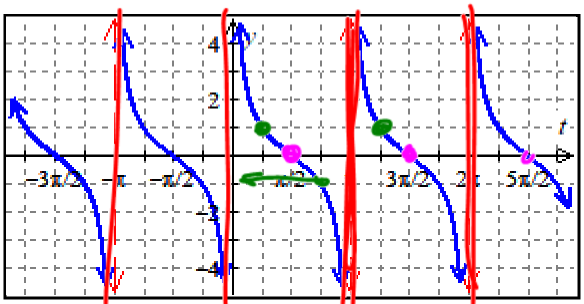
A graph $y = \tan(t)$.

$\tan(t) = 0 \Rightarrow \sin(t) = 0$

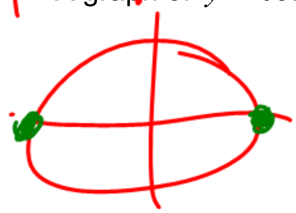
Below is the graph of $y = \cot(t)$. Let's discuss why it looks like it does.

$$\cot(t) = \frac{\cos(t)}{\sin(t)}$$

$\sin(t) = 0 \Rightarrow \cot(t)$ und



A graph of $y = \cot(t)$.



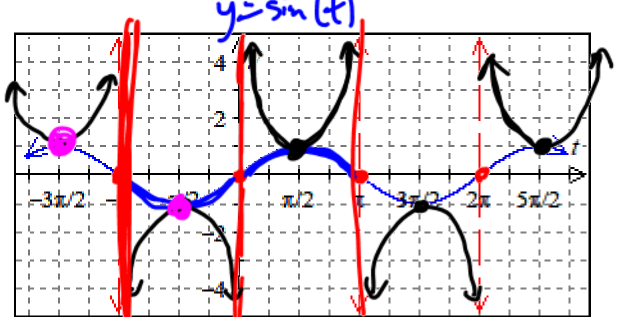
$$y = \frac{1}{x}$$

Let's sketch graphs of $y = \sec(t)$ and $y = \csc(t)$.

$$y = \sec(t) = \frac{1}{\cos(t)}$$

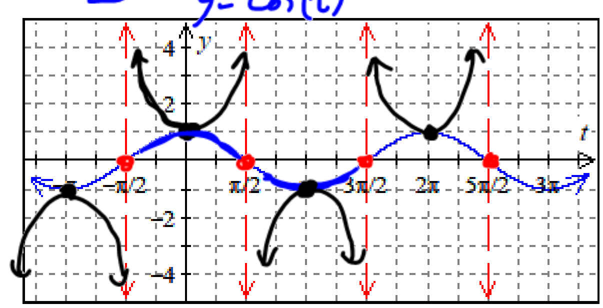
$$y = \csc(t) = \frac{1}{\sin(t)}$$

$y = \sin(t)$



Draw a graph of $y = \csc(t)$

$y = \cos(t)$



Draw graph of $y = \sec(t)$