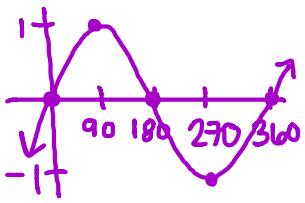


4.2 Inverse Parent Functions

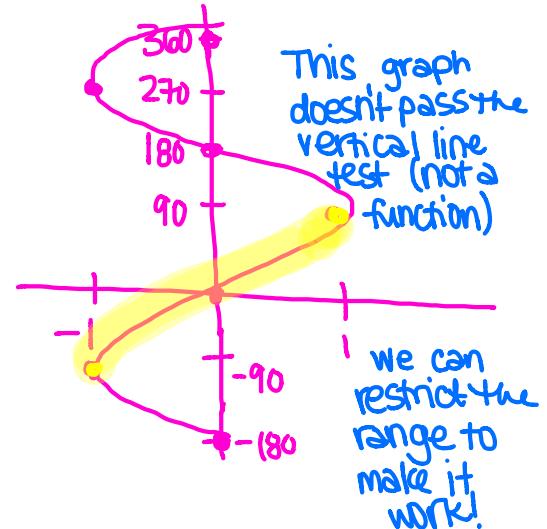
SINE $y = \sin x$

x	y
0°	0
90°	1
180°	0
270°	-1
360°	0



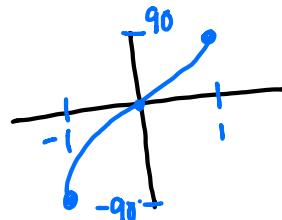
$y = \sin^{-1}(x)$
inverse \rightarrow switch $x \leftrightarrow y$

x	y
0	0°
1	90°
0	180°
-1	270°
0	360°



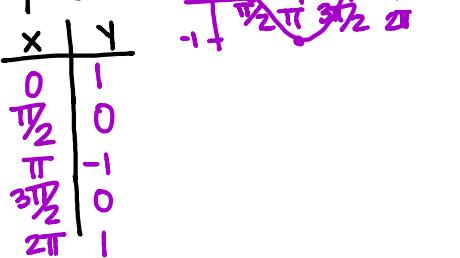
Restricted Range: $-90^\circ \leq \theta \leq 90^\circ$

$$-\frac{\pi}{2} \leq y \leq \frac{\pi}{2}$$



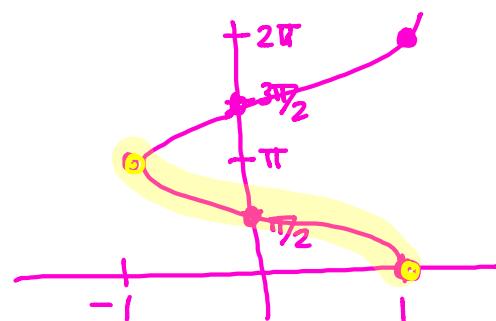
COSINE

$y = \cos x$



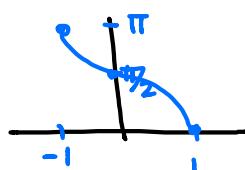
$y = \cos^{-1}(x)$

x	y
0	1
\frac{\pi}{2}	0
\pi	-1
\frac{3\pi}{2}	0
2\pi	1



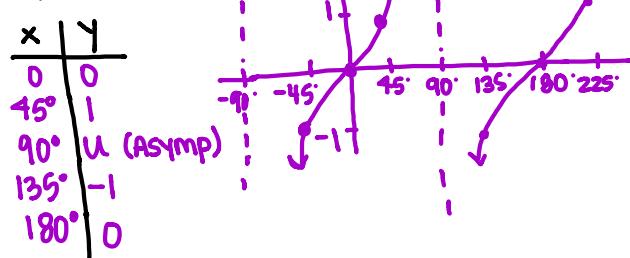
Restricted Range: $0 \leq y \leq \pi$

$$0 \leq \theta \leq 180^\circ$$



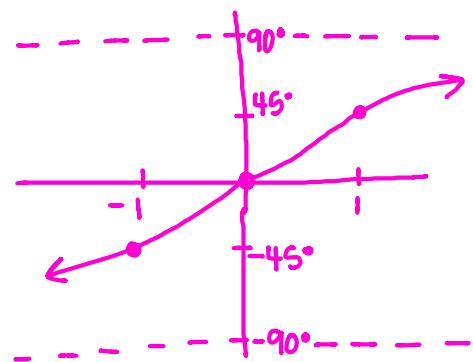
TANGENT

$y = \tan x$



$y = \tan^{-1}(x)$

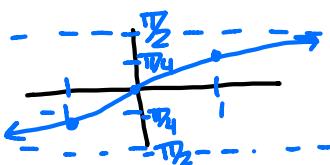
x	y
0	0
45°	1
90°	U (ASYMP)
135°	-1
180°	0



Restricted Range:

$$-90^\circ < \theta < 90^\circ$$

$$-\frac{\pi}{2} < y < \frac{\pi}{2}$$



4.2 The rest of the inverse trig functions...

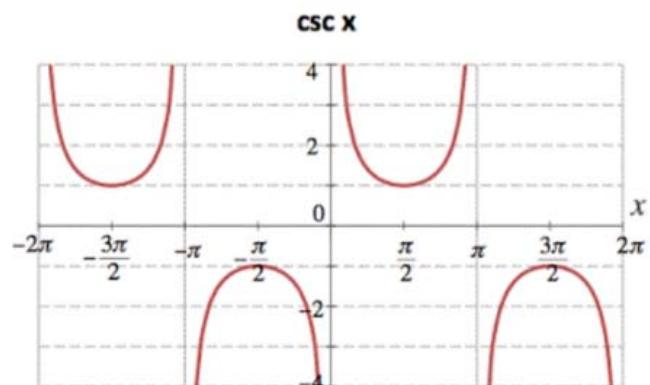
Name: _____

Remember... csc is the reciprocal of sine. Sec is the reciprocal of cosine.

Part 1. If the restricted range of the inverse sine function is $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$, what is the restricted range of the inverse cosecant function?

Fill in the table with the appropriate cosecant values

x	Csc(x)
$-\frac{\pi}{2}$	-1
0	und (asymptote)
$\frac{\pi}{2}$	1

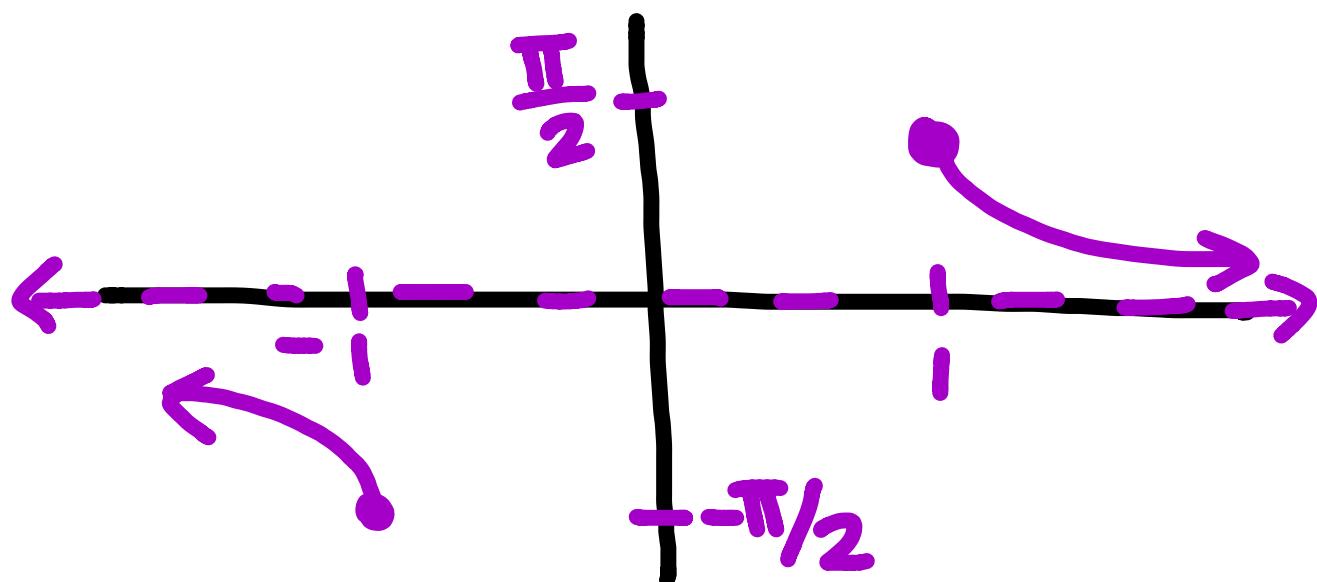


Remember, to find an inverse of a function, switch your x & y values.

x	$\text{Csc}^{-1}(x)$
-1	$-\frac{\pi}{2}$
0	und (horizontal asymptote at y=0)
1	$\frac{\pi}{2}$

If a function value is undefined, what attribute will appear on the graph? HINT: think of the graph of normal cosecant. What happens every π radians? **Asymptote**

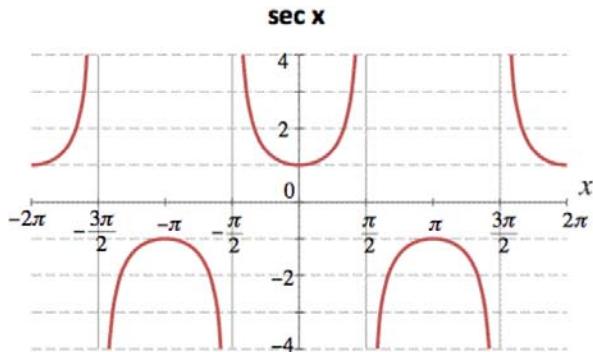
Sketch the graph of $y = \text{csc}^{-1}(x)$ below. Label each critical point and any horizontal asymptotes.



Part 2. If the restricted range of the inverse cosine function is $[0, \pi]$, what is the restricted range of the inverse secant function?

Fill in the table with the appropriate secant values

x	sec(x)
0	1
$\frac{\pi}{2}$	und.
π	-1

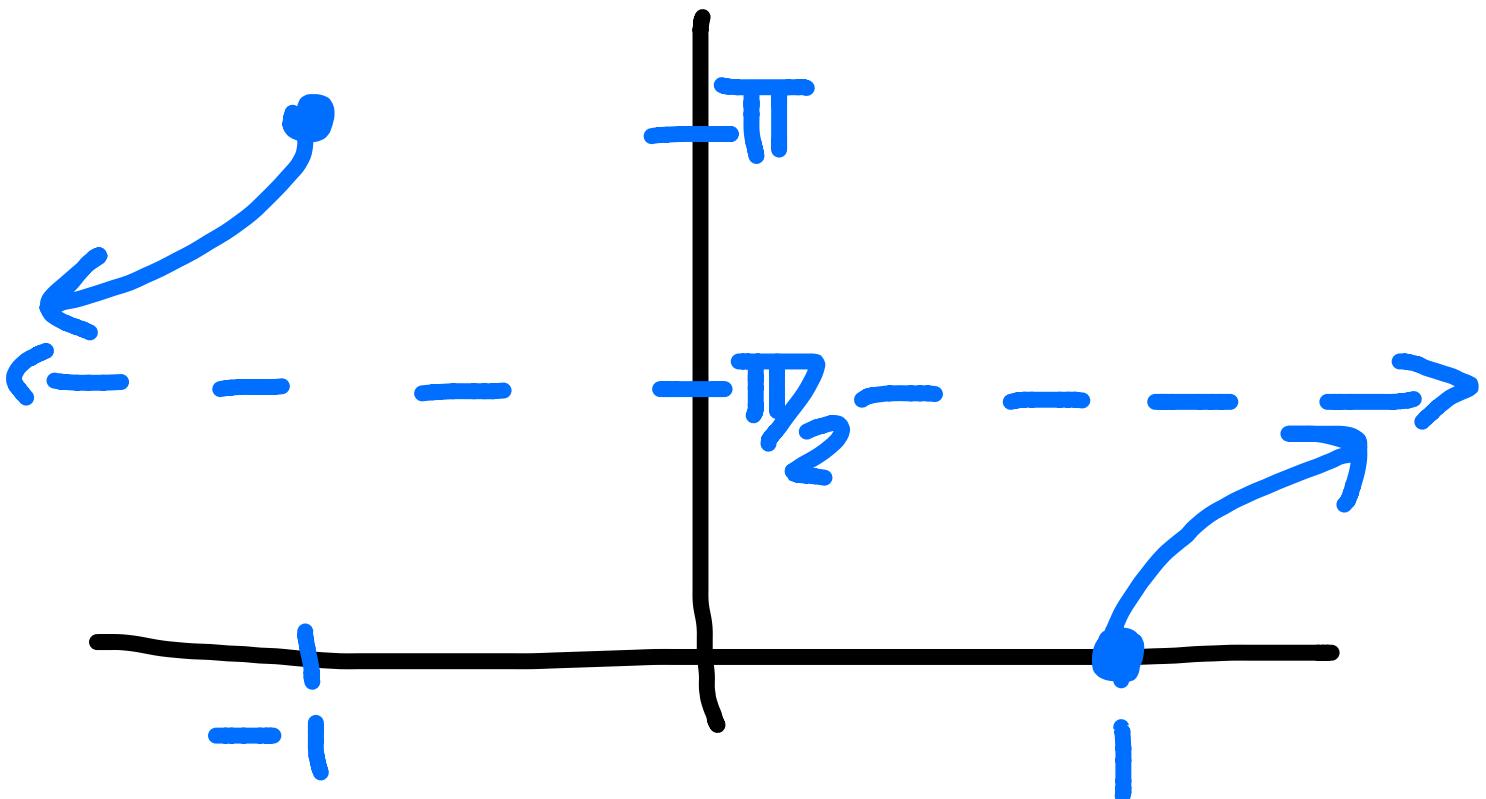


Find your inverse critical values and fill in the table below.

x	$\sec^{-1}(x)$
1	0
und.	$\frac{\pi}{2}$
-1	π

What happens at $x = \frac{\pi}{2}$? horizontal asymptote

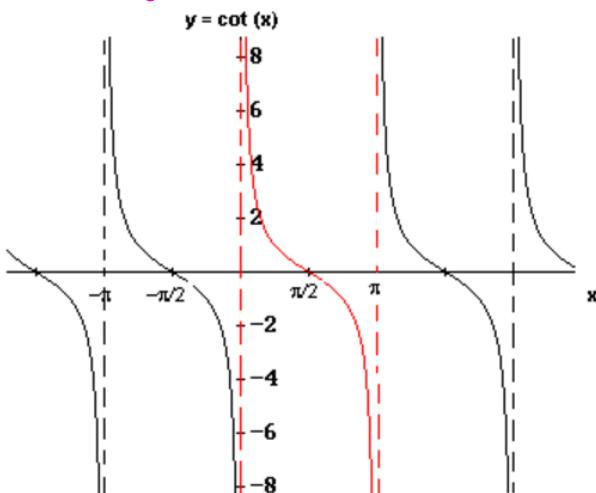
Sketch the graph of $y = \sec^{-1}(x)$ below. Label each critical point and any horizontal asymptotes.



Part 3. The restricted range of the inverse cotangent function is $(0, \pi)$. What do the parenthesis tell you will happen at those end points? **Asymptotes (can't equal)**

Fill in the table with the appropriate cotangent values

x	$\cot(x)$
0	∞
$\frac{\pi}{4}$	1
$\frac{\pi}{2}$	0
$\frac{3\pi}{4}$	-1
π	∞



Find your inverse critical values and fill in the table below.

x	$\cot^{-1}(x)$
∞	0
1	$\pi/4$
0	$\pi/2$
-1	$3\pi/4$
∞	π

What happens at $x=0$ and $x=\pi$? **Asymptotes**

Sketch the graph of $y = \cot^{-1}(x)$ below. Label each critical point and any horizontal asymptotes.



