

Undefined Trig Values

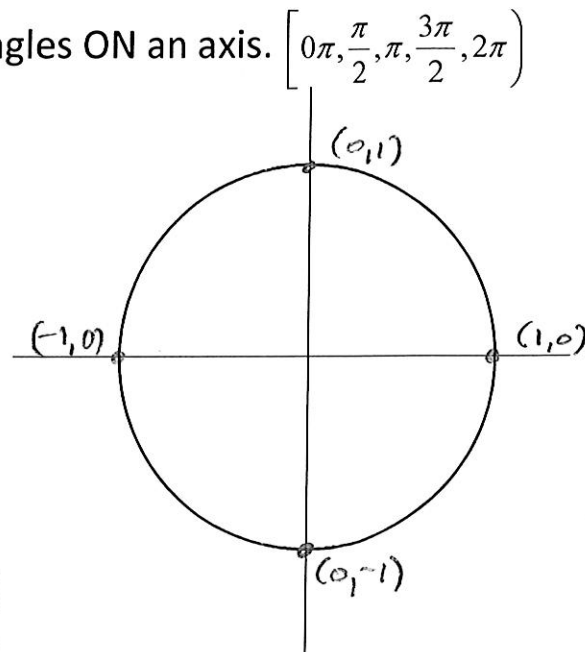
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The Facts:

- Sine and Cosine values are NEVER undefined.
- The other trig values are ONLY undefined at angles ON an axis. $\left[0\pi, \frac{\pi}{2}, \pi, \frac{3\pi}{2}, 2\pi\right]$
- $\frac{0}{1}$ is 0. $\frac{1}{0}$ is undefined.
- The reciprocal of 0 is "undefined".

Part 1:

Using the unit circle, find the following values:



$$\sin 0\pi = 0$$

$$\cos 0\pi = 1$$

$$\tan 0\pi = 0$$

$$\csc 0\pi = \text{undefined}$$

$$\sec 0\pi = 1$$

$$\cot 0\pi = \text{undefined}$$

$$\sin \pi = 0$$

$$\cos \pi = -1$$

$$\tan \pi = 0$$

$$\csc \pi = \text{undefined}$$

$$\sec \pi = -1$$

$$\cot \pi = \text{undefined}$$

$$\sin \frac{\pi}{2} = 1$$

$$\cos \frac{\pi}{2} = 0$$

$$\tan \frac{\pi}{2} = \text{undefined}$$

$$\csc \frac{\pi}{2} = 1$$

$$\sec \frac{\pi}{2} = \text{undefined}$$

$$\cot \frac{\pi}{2} = 0$$

$$\sin \frac{3\pi}{2} = -1$$

$$\cos \frac{3\pi}{2} = 0$$

$$\tan \frac{3\pi}{2} = \text{undefined}$$

$$\csc \frac{3\pi}{2} = -1$$

$$\sec \frac{3\pi}{2} = \text{undefined}$$

$$\cot \frac{3\pi}{2} = 0$$

Part 2:

Organize the trig values you found for each trig function in the table below.

$x =$	0π	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$
$\sin x$	0	1	0	-1
$\cos x$	1	0	-1	0
$\tan x$	0	undefined	0	undefined
$\csc x$	undefined	1	undefined	-1
$\sec x$	1	undefined	-1	undefined
$\cot x$	undefined	0	undefined	0

Part 3:

Tomorrow, we will be solving trig equations that have extraneous solutions. That means that you get an "answer" for one trig function in the equation that make the other trig function undefined. To prepare for this, answer the following questions.

What functions are undefined at 0π ? \csc & \cot

What functions are undefined at $\frac{\pi}{2}$? \tan & \sec

What functions are undefined at π ? \csc & \cot

What functions are undefined at $\frac{3\pi}{2}$? \tan & \sec