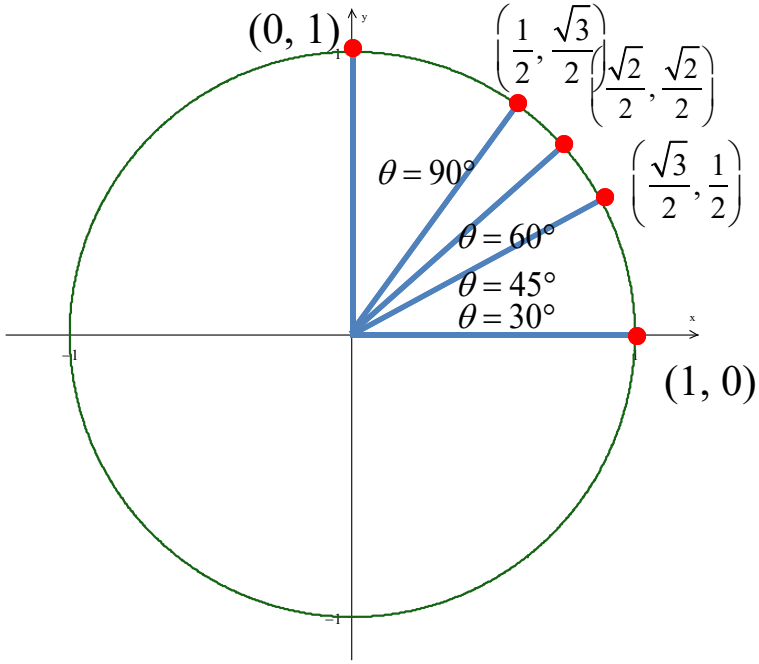
	0°	30°	45°	60°	90°	120°	135°	150°	180°
θ^{rad}	0^{rad}	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	$\frac{2\pi}{3}$	$\frac{3\pi}{4}$	$\frac{5\pi}{6}$	π
$\sin\theta$	$\frac{\sqrt{0}}{2}$	$\frac{\sqrt{1}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$					
$\cos\theta$	$\frac{\sqrt{4}}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{1}}{2}$					

$$\sin\theta = y$$

$$\cos\theta = x$$

$$\tan\theta = \frac{y}{x}$$

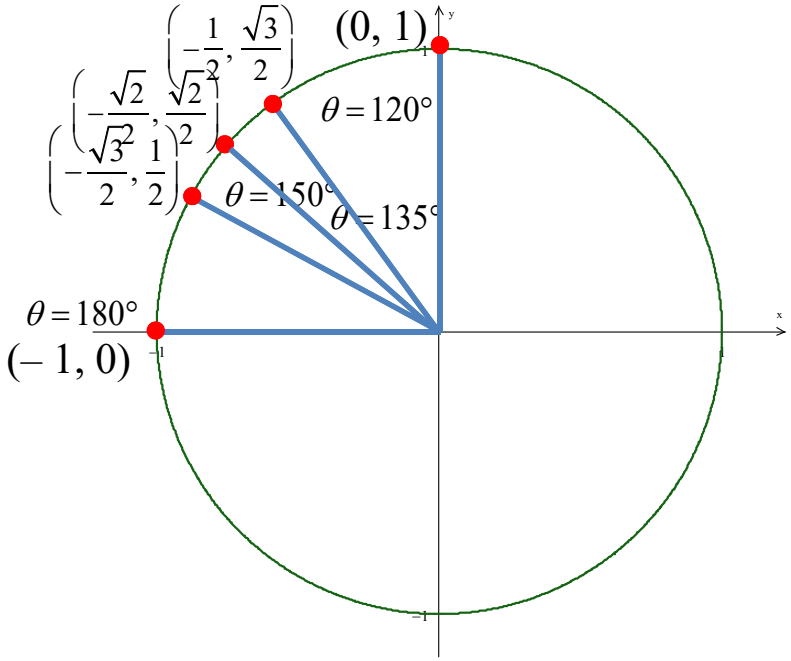


	0°	30°	45°	60°	90°	120°	135°	150°	180°
θ^{rad}	0^{rad}	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	$\frac{2\pi}{3}$	$\frac{3\pi}{4}$	$\frac{5\pi}{6}$	π
$\sin\theta$	$\frac{\sqrt{0}}{2}$	$\frac{\sqrt{1}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{4}}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{1}}{2}$	$\frac{\sqrt{0}}{2}$
$\cos\theta$	$\frac{\sqrt{4}}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{1}}{2}$	$\frac{\sqrt{0}}{2}$	$-\frac{\sqrt{1}}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{4}}{2}$

$$\sin\theta = y$$

$$\cos\theta = x$$

$$\tan\theta = \frac{y}{x}$$



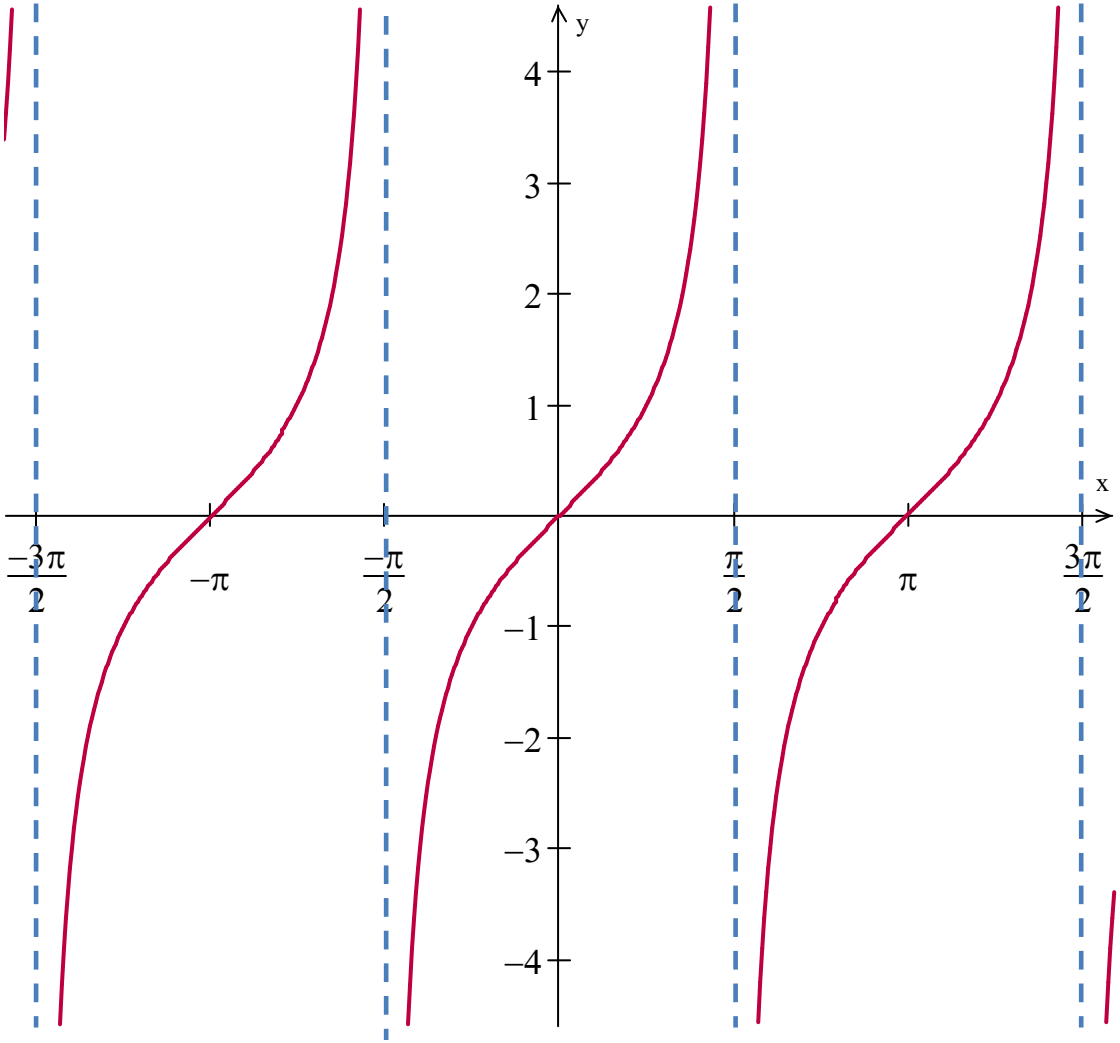
	0°	30°	45°	60°	90°	120°	135°	150°	180°
θ^{rad}		$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	$\frac{2\pi}{3}$	$\frac{3\pi}{4}$	$\frac{5\pi}{6}$	π
$\sin\theta$	$\frac{\sqrt{0}}{2}$	$\frac{\sqrt{1}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{4}}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{1}}{2}$	$\frac{\sqrt{0}}{2}$
$\cos\theta$	$\frac{\sqrt{4}}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{1}}{2}$	$\frac{\sqrt{0}}{2}$	$-\frac{\sqrt{1}}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{4}}{2}$
$\tan\theta$	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	*undefined*	$-\sqrt{3}$	-1	$-\frac{1}{\sqrt{3}}$	0

$$\tan\frac{\pi}{6}=\frac{y}{x}=\frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}}=\frac{1}{\sqrt{3}}$$ which can also be written as $\frac{\sqrt{3}}{3}$ but is not required

$$\tan\frac{\pi}{4}=\frac{y}{x}=\frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}}=1$$

The tangent function can also be written as

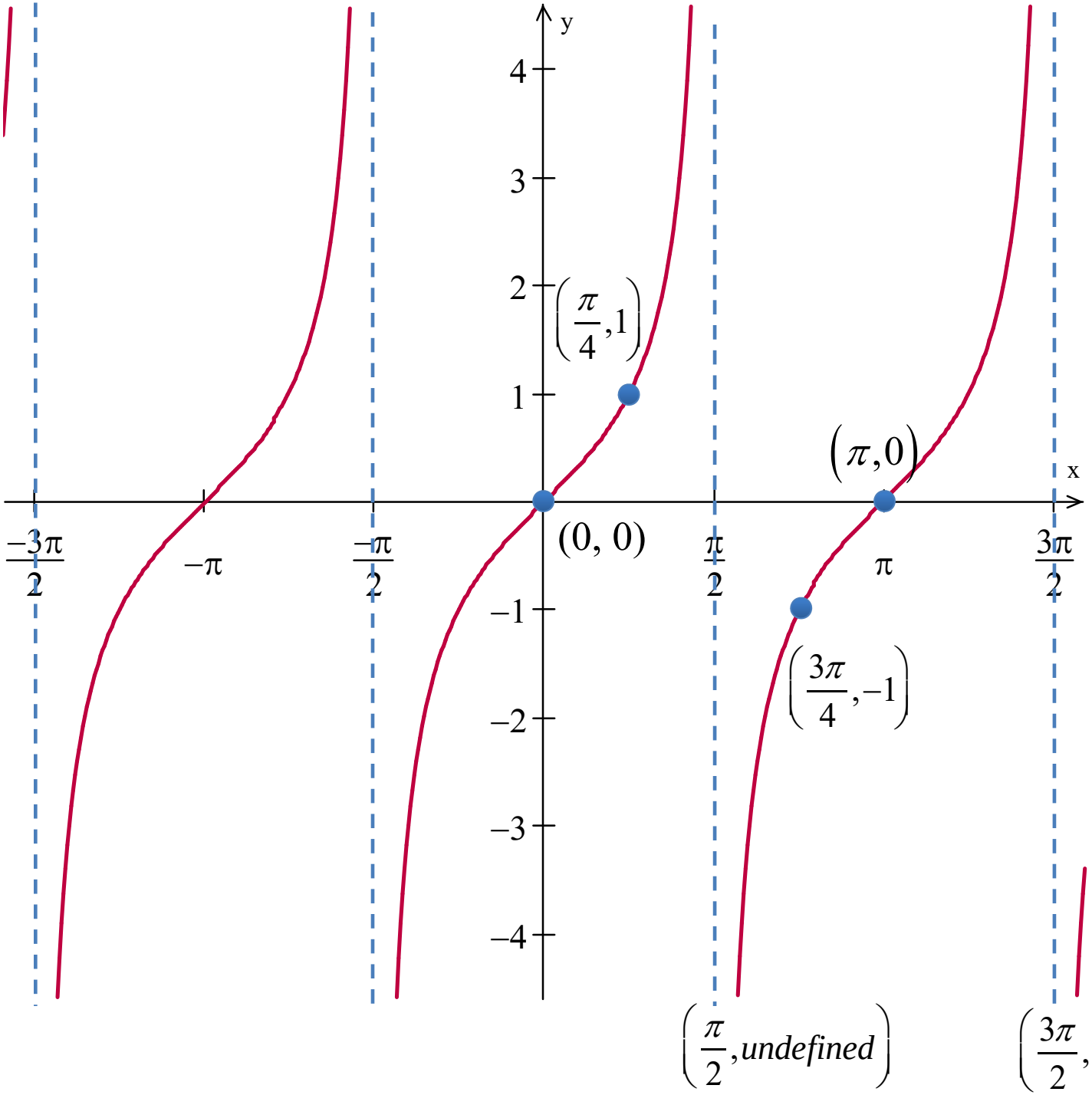
$$\tan\theta=\frac{\sin\theta}{\cos\theta}$$ …think about it



$y = \tan x$

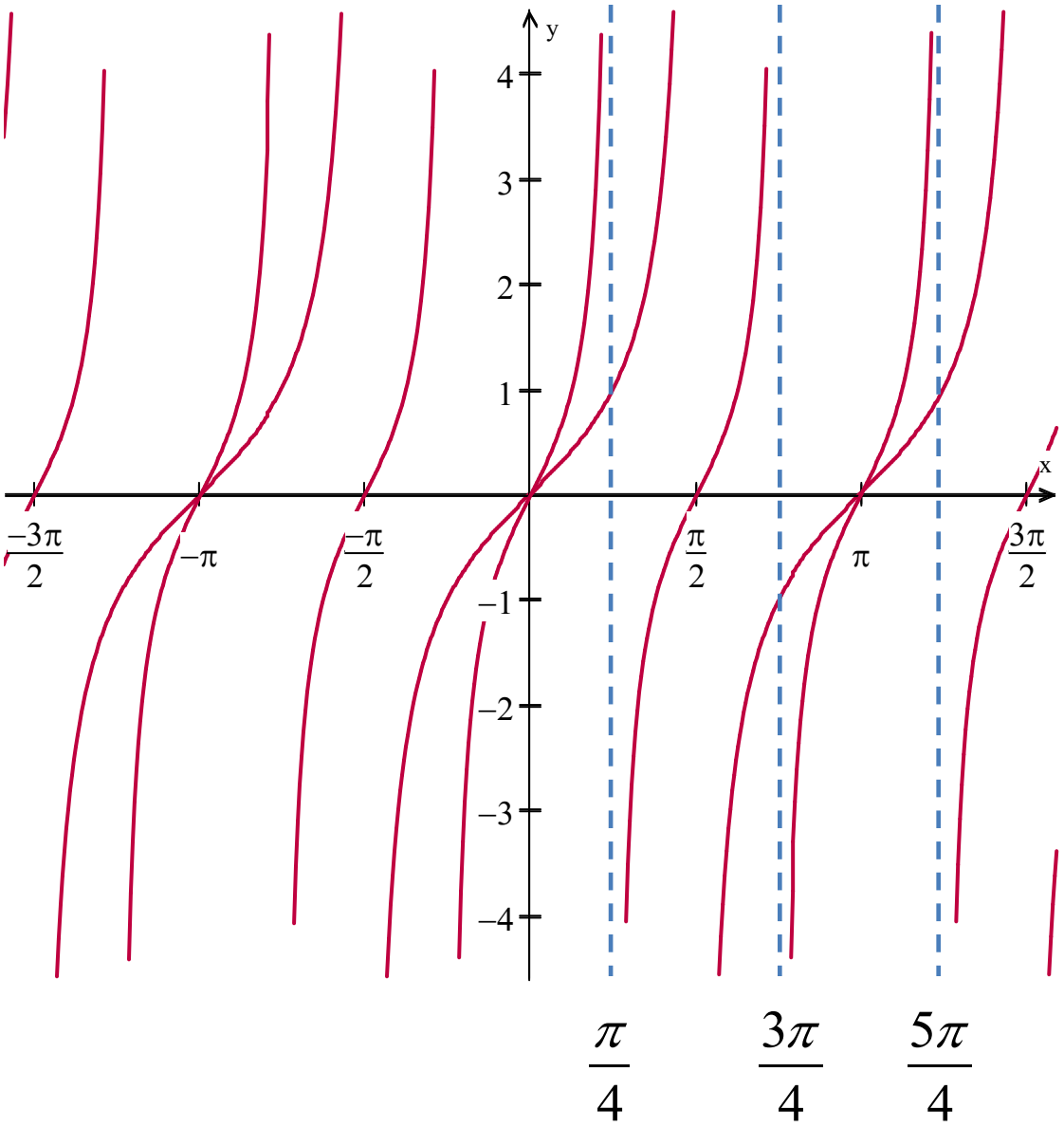
Check your trig tables to see why it looks this way

Let's take a closer look



$y = \tan x$

Check your trig tables to see why it looks this way



$$y = \tan 2x$$

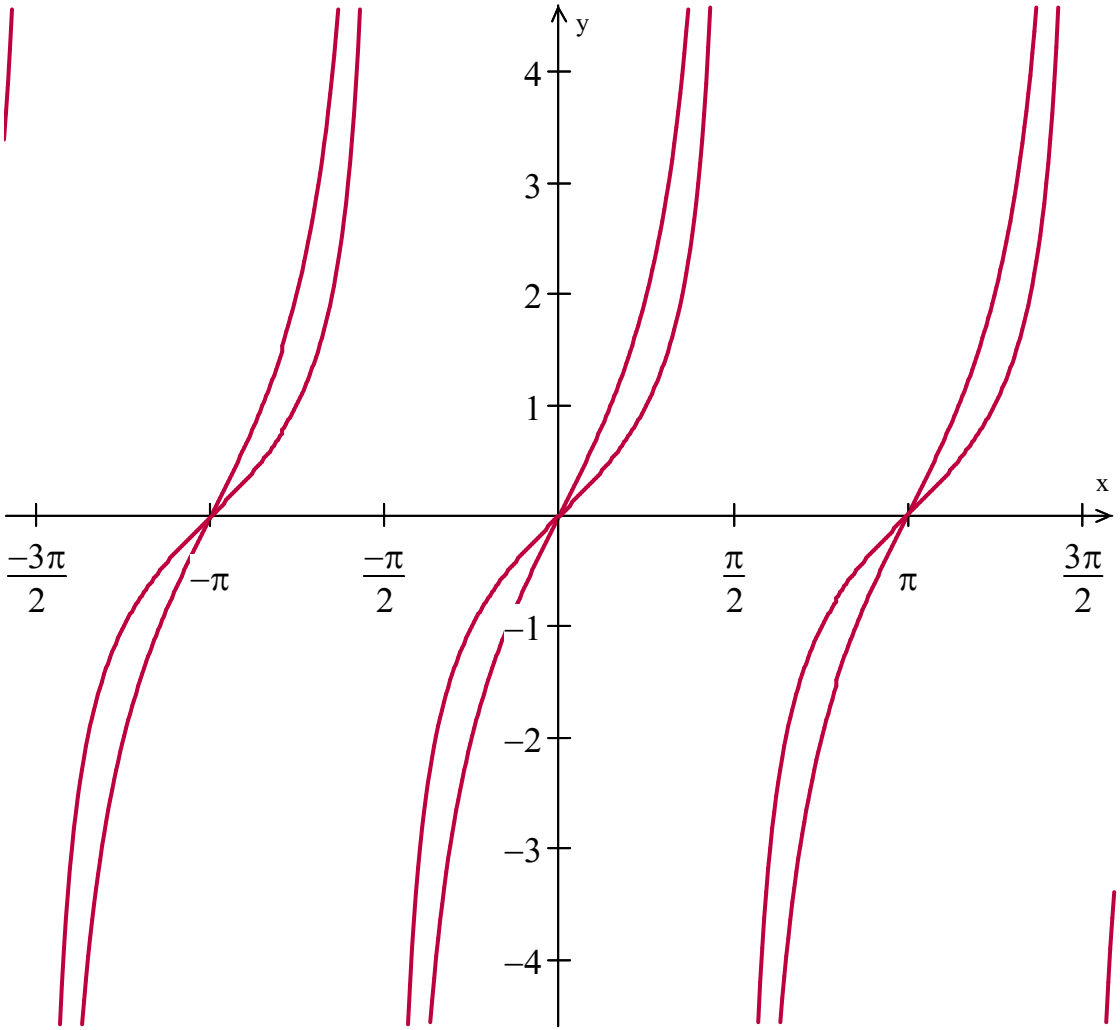
Try plugging each into the function to see for yourself

$$\tan 2\frac{\pi}{4} = \tan\frac{\pi}{2} = \textbf{\textit{undefined}}$$

$$\tan 2\frac{3\pi}{4} = \tan\frac{3\pi}{2} = \textbf{\textit{undefined}}$$

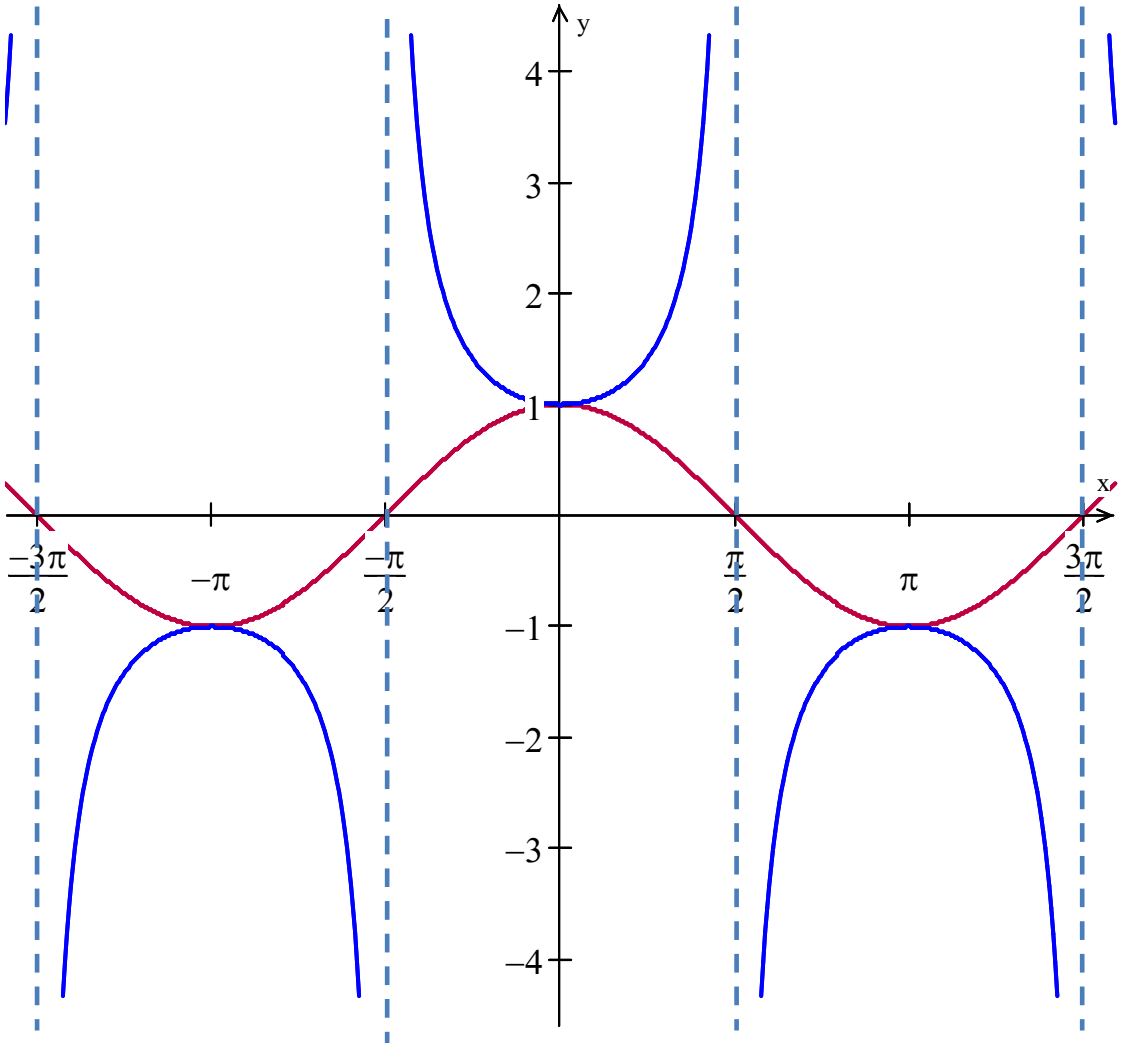
$$\tan 2\frac{5\pi}{4} = \tan\frac{5\pi}{2} = \textbf{\textit{undefined}}$$

Why is this?



$$y = 2\tan x$$

Try other changes on your graphing calculator. Be sure you know your window and scale settings



Recall that the vertical asymptotes are where $\cos x = 0$

$$y = \cos x$$

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

The same will apply for the sine and cosecant functions

Try adjusting the period, amplitude and shifts on your calculator.