4.3 Graphs of tangent and Cotangent
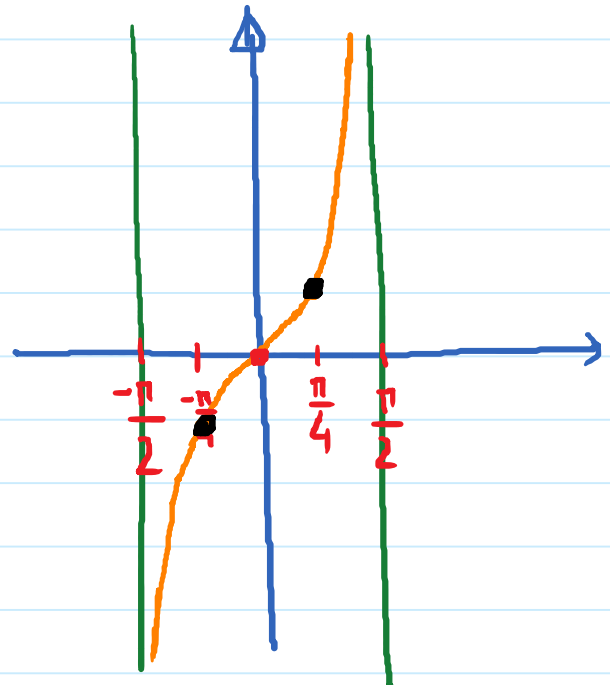
$$y = \tan x = \frac{\sin x}{\cos x}$$

$\frac{\pi}{2}$
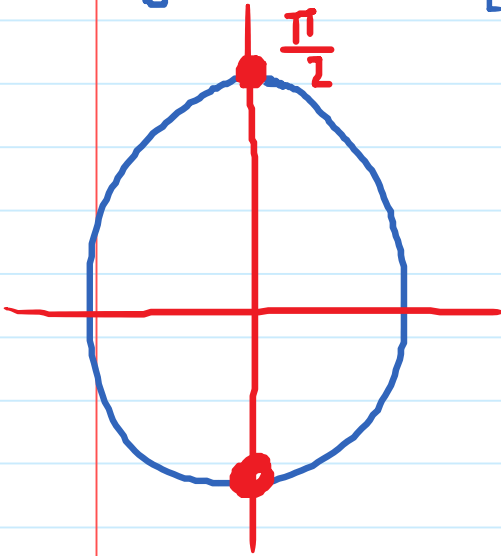
$\cos x = 0$ when $x = \frac{\pi}{2} + K \cdot \pi$

$\tan x$ is undefined when $x = \frac{\pi}{2} + K \cdot \pi$
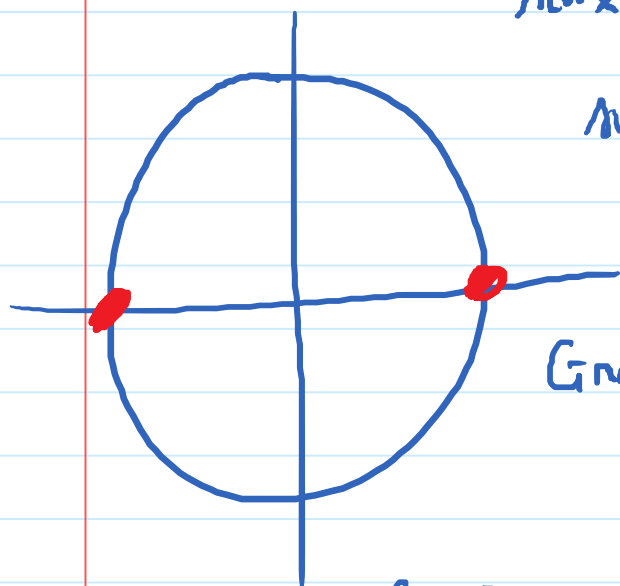
Graph of $\tan x$ has vertical

asymptotes when $x = \frac{\pi}{2} + K \cdot \pi$.

1 - basic cycle: Start at $-\frac{\pi}{2}$, ends at $\frac{\pi}{2}$.

x	$y = \tan x$
$-\frac{\pi}{2}$	undefined → V.A.
$-\frac{\pi}{4}$	-1
0	0
$\frac{\pi}{4}$	1
$\frac{\pi}{2}$	undefined → V.A.

$$y = \cot x = \frac{\cos x}{\sin x}$$

$\sin x = 0$ when $x = k \cdot \pi$

$\cot x$ is undefined when $x = k \cdot \pi$

Graph of $\cot x$ has V.A. when

$$x = k \cdot \pi.$$

1 basic cycle of cot: starts at 0   ends at π.

x	$y = \cot x$
0	undefined → V.A
$\frac{\pi}{4}$	1
$\frac{\pi}{2}$	0
$\frac{3\pi}{4}$	−1
π	undefined → V.A.