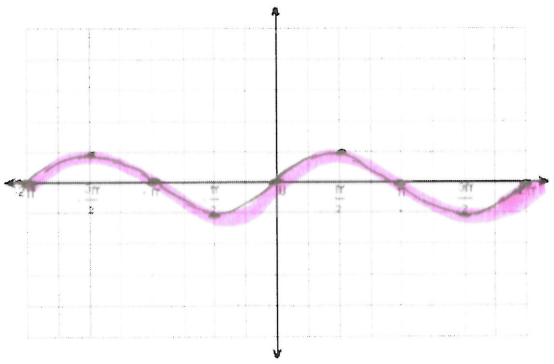
Section 3-1: Graphing Trig Functions

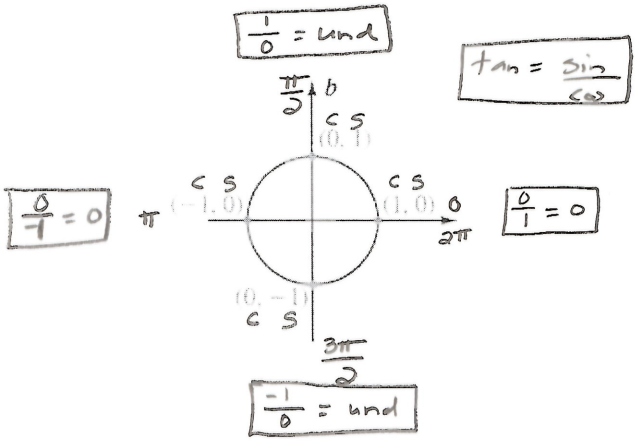
$y = \sin x$

Domain: $x \mid x \in \mathbb{R}$ Range: $-1 \leq y \leq 1$ Period: 2π

* length to complete 1 cycle

x-intercepts: $k\pi$, k an integer Asymptotes: none

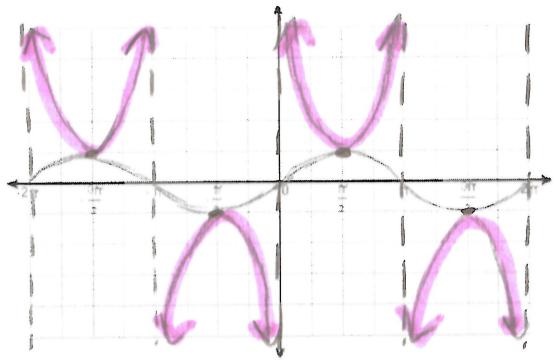




$y = \csc x$ Recall: $\csc x = \dfrac{1}{\sin x}$ * $\csc x$ **is undefined when** $\sin x = 0$

Domain: $x \mid x \in \mathbb{R}$, except $k\pi$, k an integer Range: $y \leq -1$ or $y \geq 1$ Period: 2π

x-intercepts: none Asymptotes: $k\pi$, k an integer

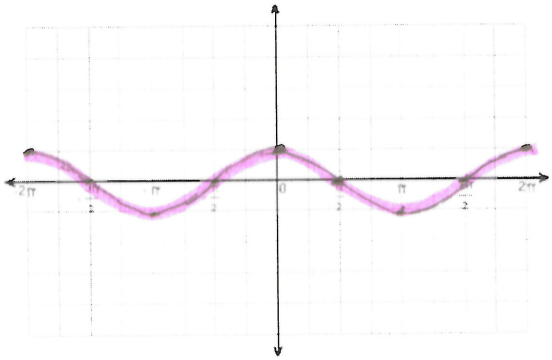


1) Graph $\sin x$ to help with the placement of $\csc x$. *Note: $\sin x$ is NOT part of the graph.
2) Draw dashed vertical asymptotes at the x-intercepts of $\sin x$.
3) Draw parabolas at every min and max of $\sin x$.

$y = \cos x$

Domain: $x \mid x \in \mathbb{R}$ Range: $-1 \leq y \leq 1$ Period: 2π

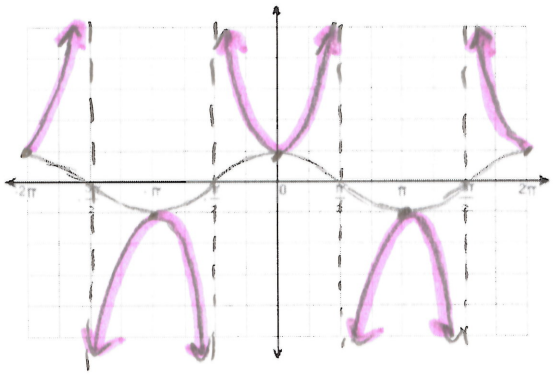
x-intercepts: $\frac{\pi}{2} + k\pi$, k an integer Asymptotes: none



$y = \sec x$ Recall: $\sec x = \dfrac{1}{\cos x}$ * $\sec x$ **is undefined when** $\cos x = 0$

Domain: $x \mid x \in \mathbb{R}$, except $\frac{\pi}{2} + K\pi$, K an integer Range: $y \leq -1$ or $y \geq 1$ Period: 2π

x-intercepts: none Asymptotes: $\frac{\pi}{2} + K\pi$, K an integer

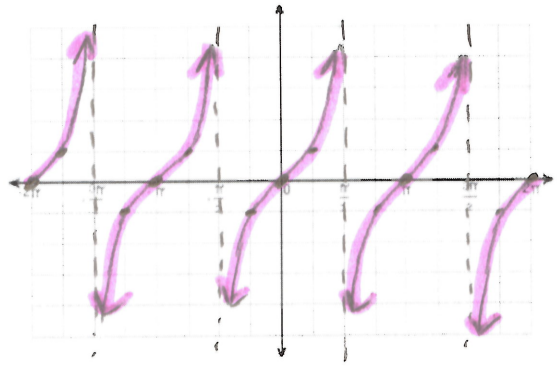


1) Graph $\cos x$ to help with the placement of $\sec x$. *Note: $\cos x$ is NOT part of the graph.
2) Draw dashed vertical asymptotes at the x-intercepts of $\cos x$.
3) Draw parabolas at every min and max of $\cos x$.

$y = \tan x$ Recall: $\tan x = \dfrac{\sin x}{\cos x}$ * $\tan x$ **is undefined when** $\cos x = 0$

Domain: $x \mid x \in \mathbb{R}$, except $\frac{\pi}{2} + K\pi$, K an integer Range: $y \mid y \in \mathbb{R}$ Period: π

x-intercepts: $K\pi$, K an integer Asymptotes: $\frac{\pi}{2} + K\pi$, K an integer

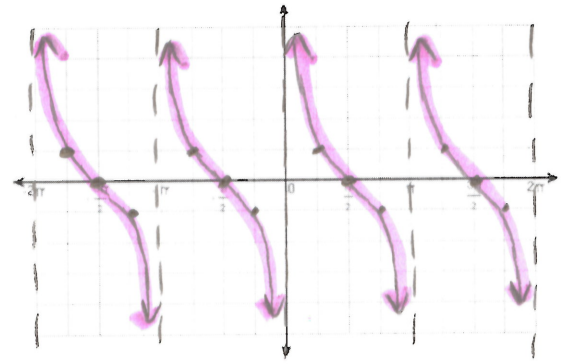


1) Draw dashed vertical asymptotes at the x-intercepts of $\cos x$.
2) Draw x-intercepts at $K\pi$, which is midway between the asymptotes, at the ½ period mark.
3) Draw points to show a y-value of "-1" at the ¼ period mark, and "1" at the ¾ period mark.
4) Draw an **increasing** curve through the three points.

$y = \cot x$ Recall: $\cot x = \dfrac{1}{\tan x} = \dfrac{\cos x}{\sin x}$ * $\cot x$ **is undefined when** $\tan x = 0$ **or** $\sin x = 0$

Domain: Range: Period:

x-intercepts: Asymptotes:



1) Draw dashed vertical asymptotes at the x-intercepts of $\sin x$.
2) Draw x-intercepts at $\dfrac{\pi}{2} + K\pi$, which is midway between the asymptotes, at the ½ period mark.
3) Draw points to show a y-value of "1" at the ¼ period mark, and "-1" at the ¾ period mark.
4) Draw a **decreasing** curve through the three