Read 5.5-5.7 and "Trig Guide to Graphing" on brewermath.com

- 5.5: #55-60 all; 77-84 all
- 5.6 #1-47 odd; 49-54 all; 63-70 all
- 5.7 #1-50 all; #53-64 all; 87-92 all

} due Wed. 12/7

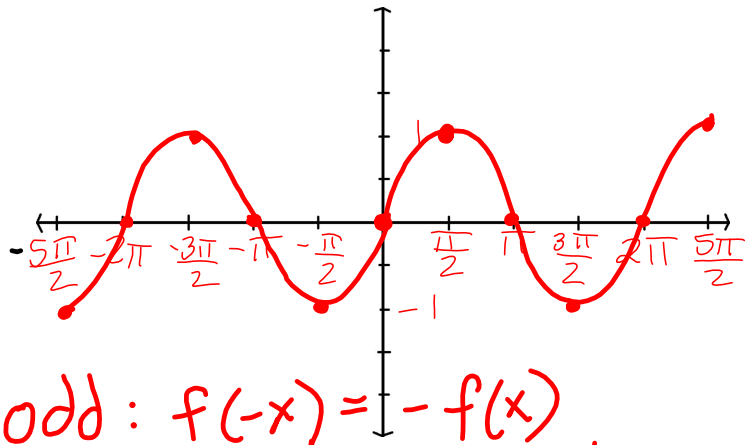
Graphs of the sine and cosine functions

y=sinx

domain: $(-\infty, \infty)$

range: $[-1, 1]$

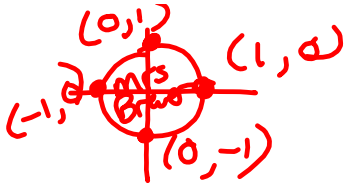
period: 2π



odd: $f(-x) = -f(x)$

symmetric with respect to origin

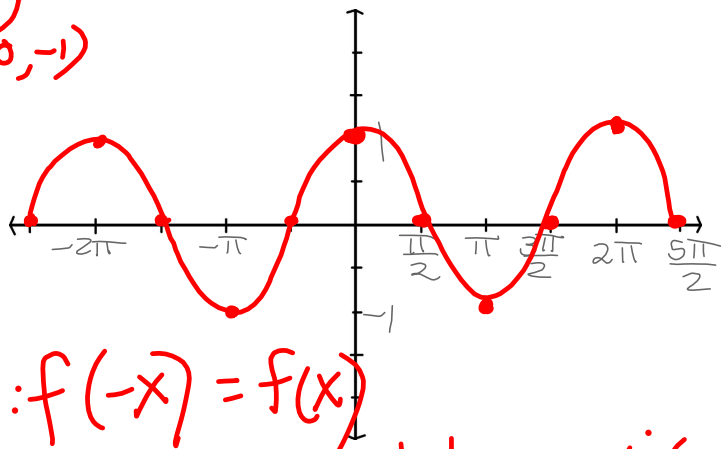
y=cosx



domain: $(-\infty,\infty)$

range: $[-1,1]$

period: 2π



even: $f(-x) = f(x)$

symmetric with respect to y-axis

Domain/Range/Period/Graphs of the other 4 Trig functions?

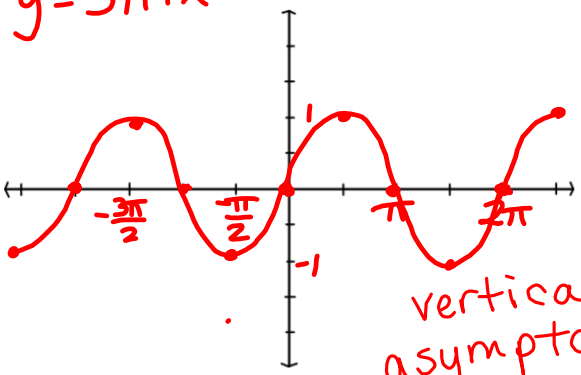
Function	Domain	Range	Period
$y = \sin x$	$(-\infty, \infty)$	$[-1,1]$	2π
$y = \cos x$	$(-\infty, \infty)$	$[-1,1]$	2π
$y = \csc x$	$\{x \mid x \text{ is not an integer multiple of } \pi\}$	$(-\infty,-1] \cup [1,\infty)$	2π
$y = \sec x$	$\left\{x \mid x \text{ is not an odd multiple of } \frac{\pi}{2}\right\}$	$(-\infty,-1] \cup [1,\infty)$	2π
$y = \tan x$	$\left\{x \mid x \text{ is not an odd multiple of } \frac{\pi}{2}\right\}$	$(-\infty, \infty)$	π
$y = \cot x$	$\{x \mid x \text{ is not an integer multiple of } \pi\}$	$(-\infty, \infty)$	π

Why?

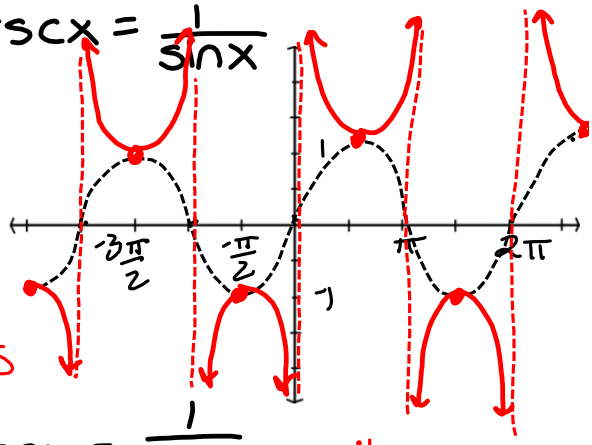
$\csc x = \frac{1}{\sin x}$ $\tan x = \frac{\sin x}{\cos x}$

$\sec x = \frac{1}{\cos x}$ $\cot x = \frac{\cos x}{\sin x}$

$y = \sin x$

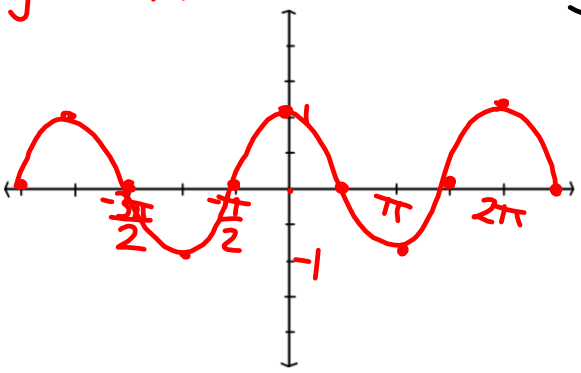


$y = \csc x = \frac{1}{\sin x}$

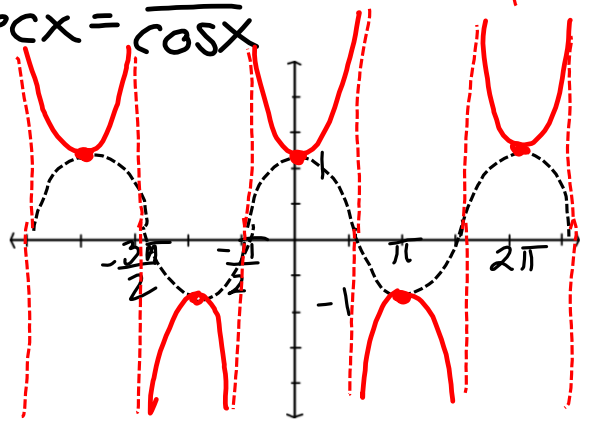


vertical asymptotes

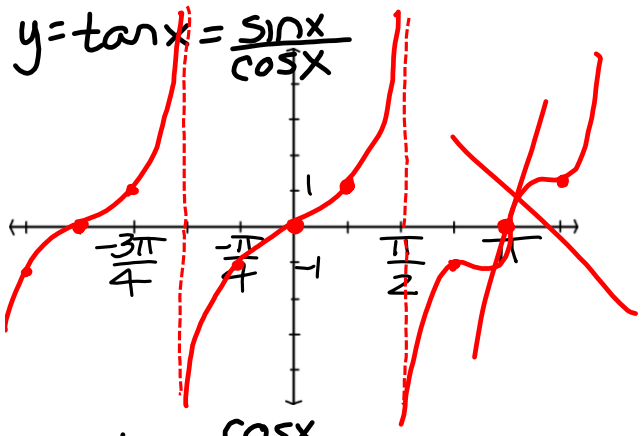
$y = \cos x$

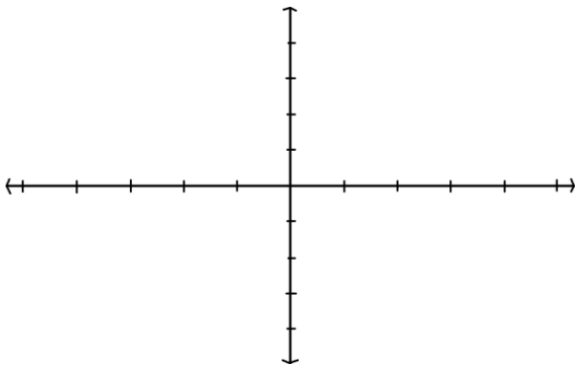


$y = \sec x = \frac{1}{\cos x}$

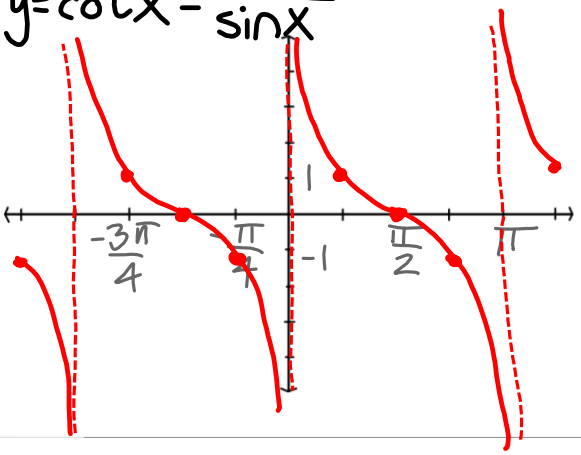


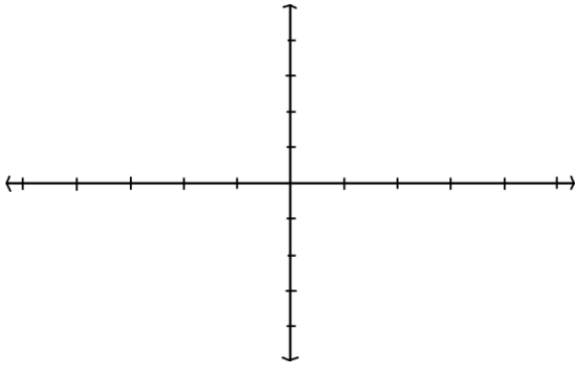
$y = \tan x = \frac{\sin x}{\cos x}$





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





$y = f(x)$

Goal:

$y = af(bx+c)+d$

$y = f(x)+g(x)$

$y = af(bx)$

multiplication always results in a stretch of the graph.

constants applied outside the function affect it vertically as we expect; inside - horizontally, opposite of what we would expect

$$\text{amplitude} = \frac{\text{max value} - \text{min value}}{2}$$

for $y = a \sin bx$

amplitude $= |a|$

If $a < 0$, vertical flip

$$\text{period} = \frac{\text{original period } (2\pi \text{ or } \pi)}{|b|}$$

If $b < 0$, horizontal flip

$y = a \cot bx$ $\quad \frac{\pi}{b}$