

Graphs of the sine and cosine functions

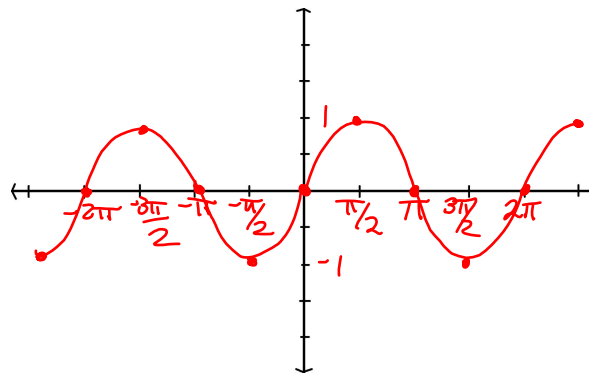
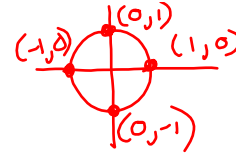
$y = \sin x$

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

range: $[-1, 1]$

period: 2π

odd: $\sin(-x) = -\sin x$
 symmetry about
 the origin



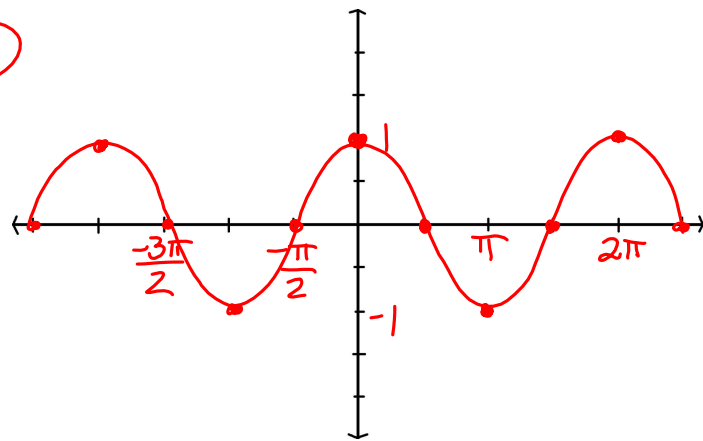
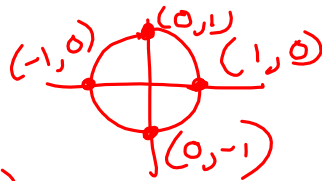
$y = \cos x$

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

range:
 $[-1, 1]$

period: 2π

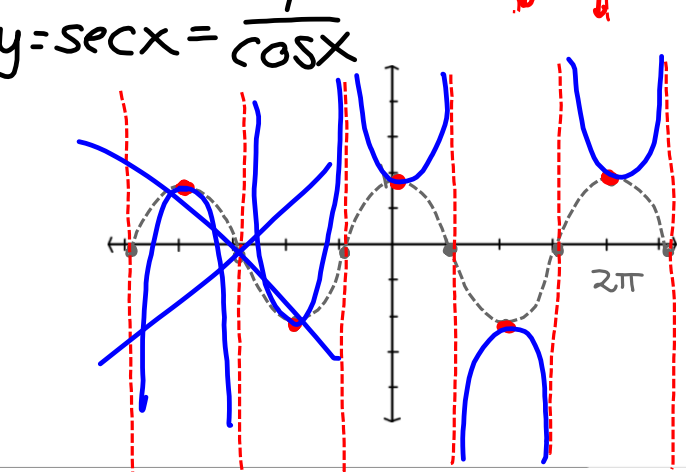
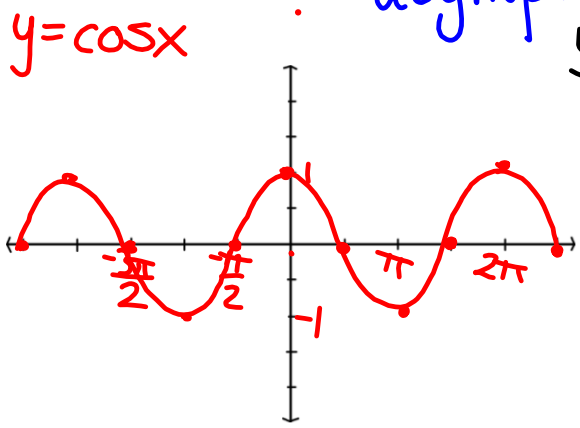
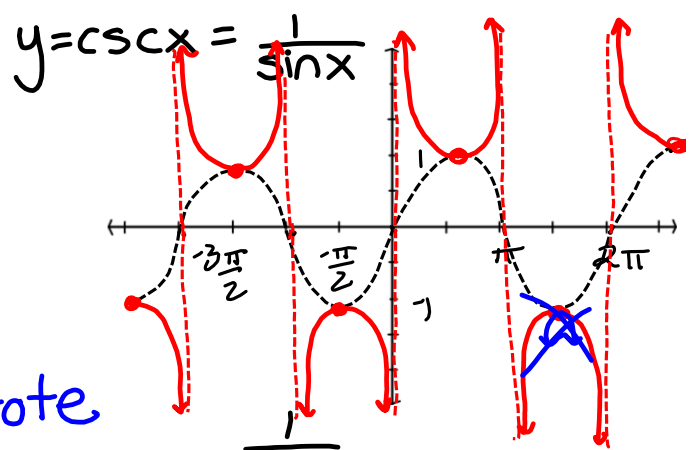
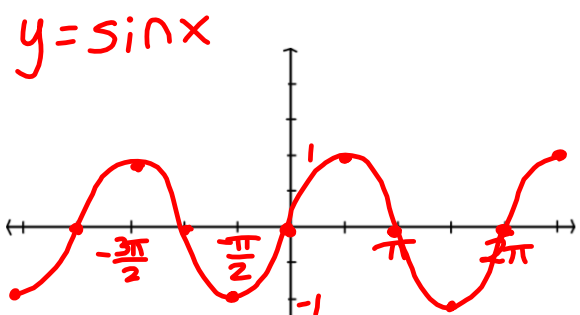
even $\cos(-x) = \cos x$
 symmetry w.r.t.
 origin



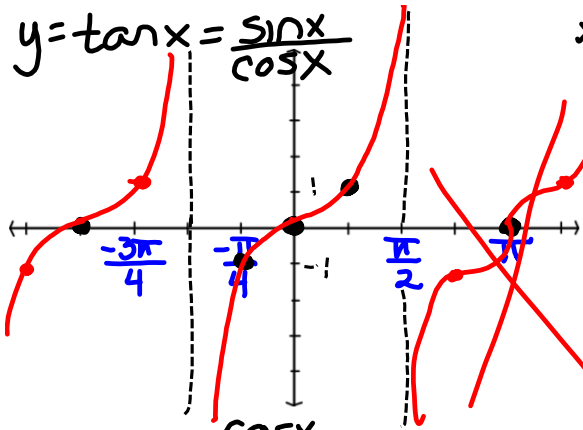
Domain/Range/Period/Graphs of the other 4 Trig functions?

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

Why? $\csc x = \frac{1}{\sin x} = \frac{1}{\frac{1}{1, 2, 3, 4, \dots}} = 1, 2, 3, 4, \dots$
 $\tan x = \frac{\sin x}{\cos x} = \frac{[-1, 1]}{[-1, 1]}$



vertical asymptote

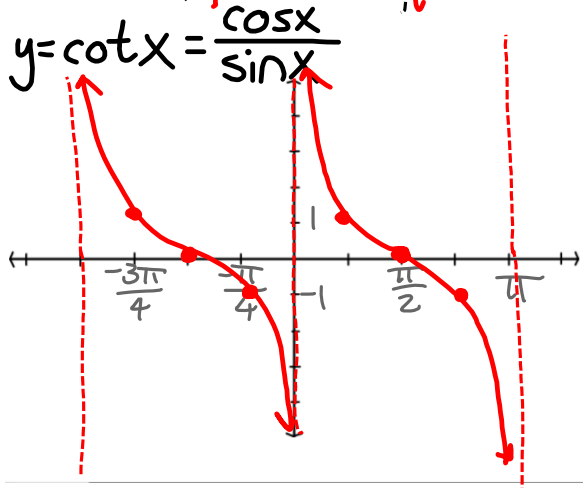


x-intercepts where $\sin x = 0$
 vertical asymptotes

where $\cos x = 0$
 @ \pm half the period

crosses through origin

drawn from bottom left to upper right



$\cot x$ drawn upper left to bottom right

V.A.'s @ 0 & the period