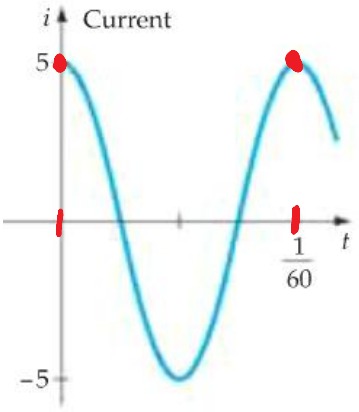
Section 5.6: The Graphs of Secant, Cosecant, Tangent, and Cotangent.

Thursday, August 28, 2014
12:02 PM

Goal: To graph these functions by hand.

Warm-up: The graph of amperage over time (in seconds) of an alternating household circuit is shown in the following graph. Write an equation for the current.



$i = A\cos(Bt)$

$A = 5$

$P = \frac{2\pi}{B}$

$\frac{1}{60} = \frac{2\pi}{B}$

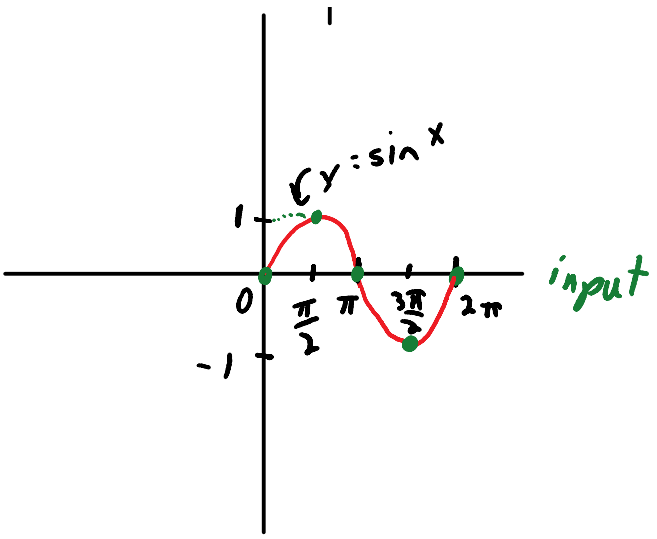
$B = 120\pi$

$i = 5\cos(120\pi t)$

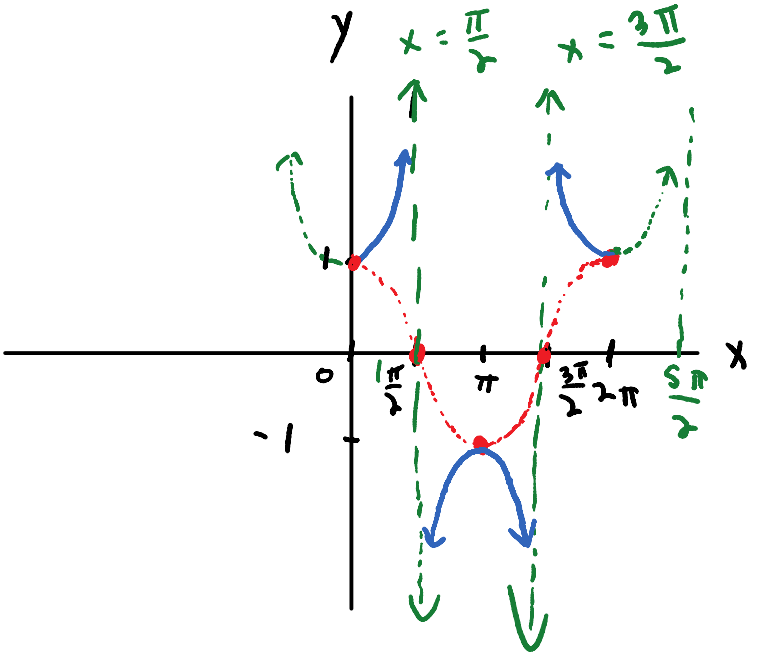
Screen clipping taken: 8/28/2014 12:12 PM

θ	$\sin\theta$	$\cos\theta$	$\tan\theta$
$30^\circ = \frac{\pi}{6}$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{3}}{3}$
$45^\circ = \frac{\pi}{4}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	1
$60^\circ = \frac{\pi}{3}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$

θ	$\sin\theta$	$\cos\theta$	$\tan\theta$
$0^\circ = 0$	0	1	0
$90^\circ = \frac{\pi}{2}$	1	0	$\not\exists$
$180^\circ = \pi$	0	-1	0
$270^\circ = \frac{3\pi}{2}$	-1	0	$\not\exists$



(ex) Graph a) $y = \sec x$



Graph in blue is one period

Helper fctn: $y = \cos x$

Domain (of secant, $y = \sec x$)

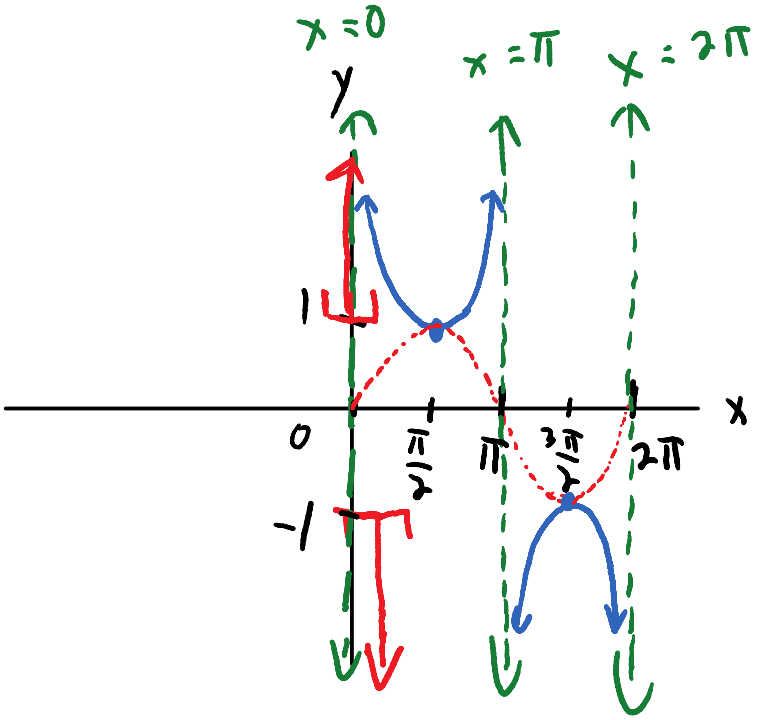
All real #'s except odd

multiples of $\frac{\pi}{2}$.

D: $\{x \mid x \neq (2k-1)\frac{\pi}{2}$, where k is an integer$\}$

$P = 2\pi$

b) $y = \csc x$



Helper: $y = \sin x$

Domain: $\{x \mid x \neq k\pi, k$ an integer$\}$

Range of both secant and cosecant

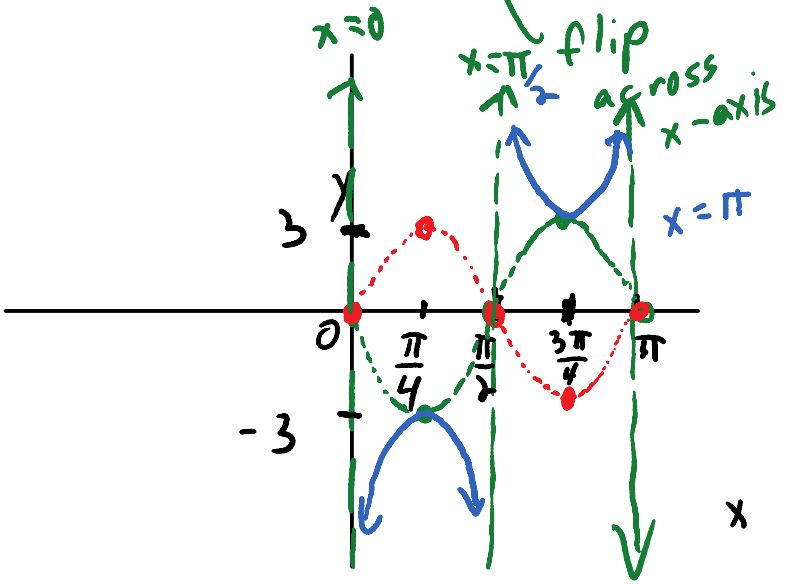
$(\quad , \quad]$

Range of $y = \csc x$:

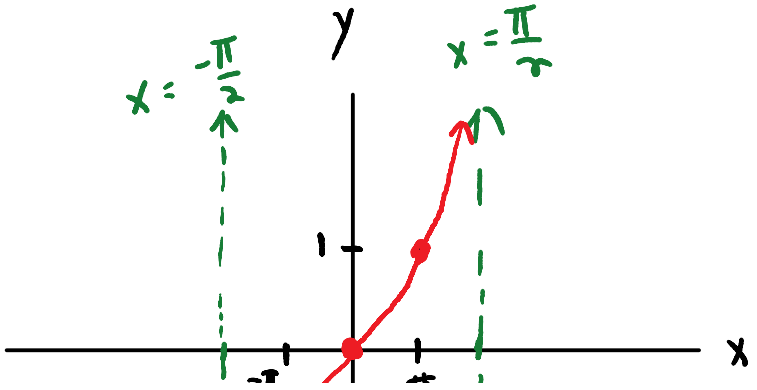
$R: \{y \mid y \le -1 \text{ or } y \ge 1\}$

c) $y = -3\csc(2x)$

helper: $y = -3\sin(2x)$ $\quad p = \frac{2\pi}{2} = \pi$

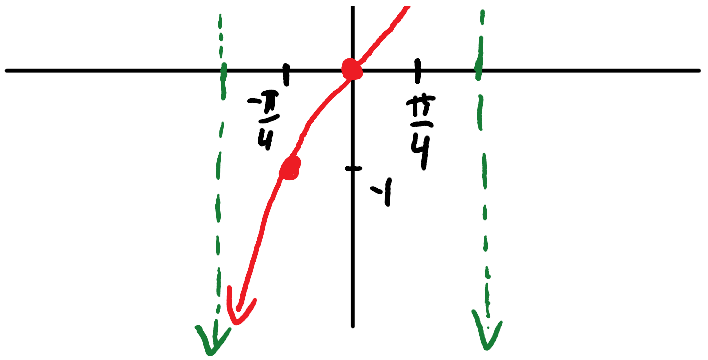


d) $y = \tan x$

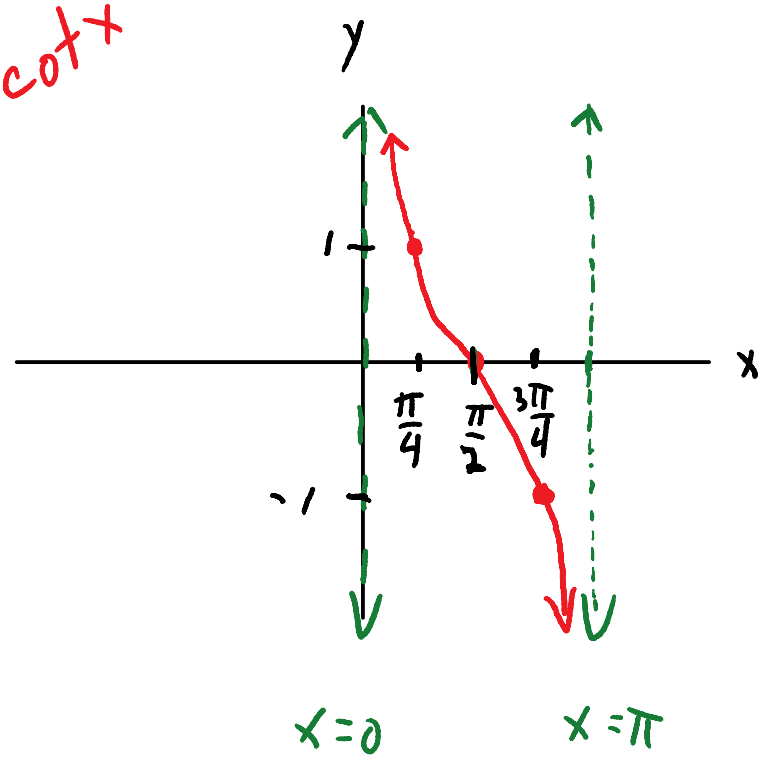


D: same as $y = \sec x$

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



e) $y = \cot x$



$x = 0$ $\quad$ $x = \pi$

Domain: Same as cosecant

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