Lesson 8-6: Graphing Tangent and Co-Functions

Today we will learn:

- How to graph Tangent
- How to graph Cosecant, Secant, and Cotangent

Graphing Tangent: $y = a \tan bx$

We are going to graph tangent using the properties of tangent and what we have already learned about sine and cosine graphs.

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

per: π
amp: NONE

D: all x;
$\quad x \neq \dfrac{\pi}{2} + n\pi$
R: $(-\infty, \infty)$

Graph the following tangent functions by hand. Find the amplitude, period, domain, and range for each.

$y = \dfrac{1}{2} \tan x$

"amp = $\dfrac{1}{2}$"
amp: NONE
per: π

D: all x;
$\quad x \neq \dfrac{\pi}{2} + n\pi$
R: $(-\infty, \infty)$

$y = 2 \tan 2x$

"amp = 2"
amp = NONE
per: $\dfrac{\pi}{b} = \dfrac{\pi}{2}$

D: all x;
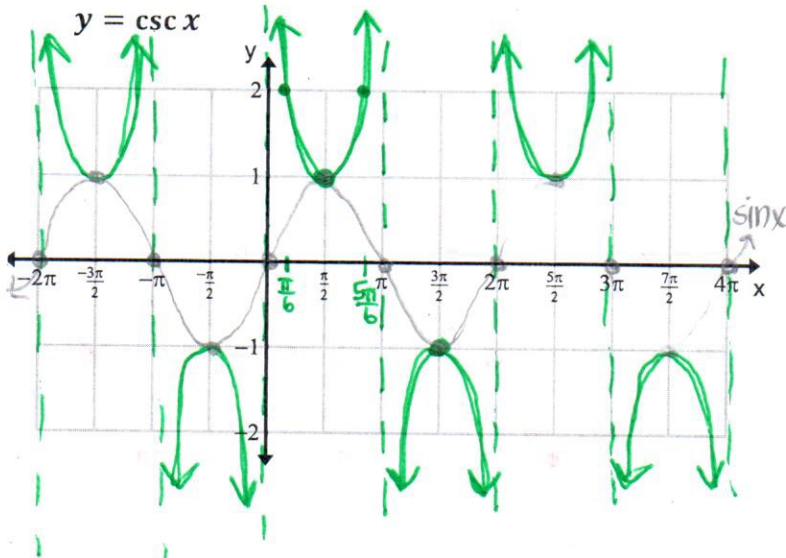$\quad x \neq \dfrac{\pi}{4} + n\dfrac{\pi}{2}$
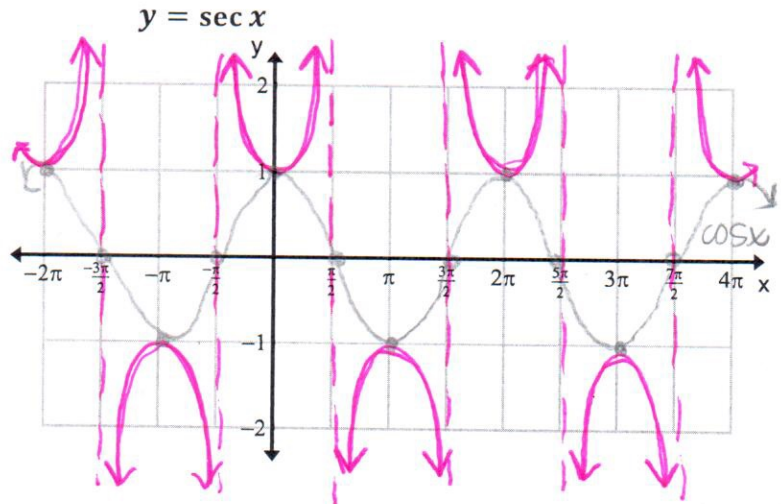R: $(-\infty, \infty)$

Let's see if we can remember some basic Trig Identities

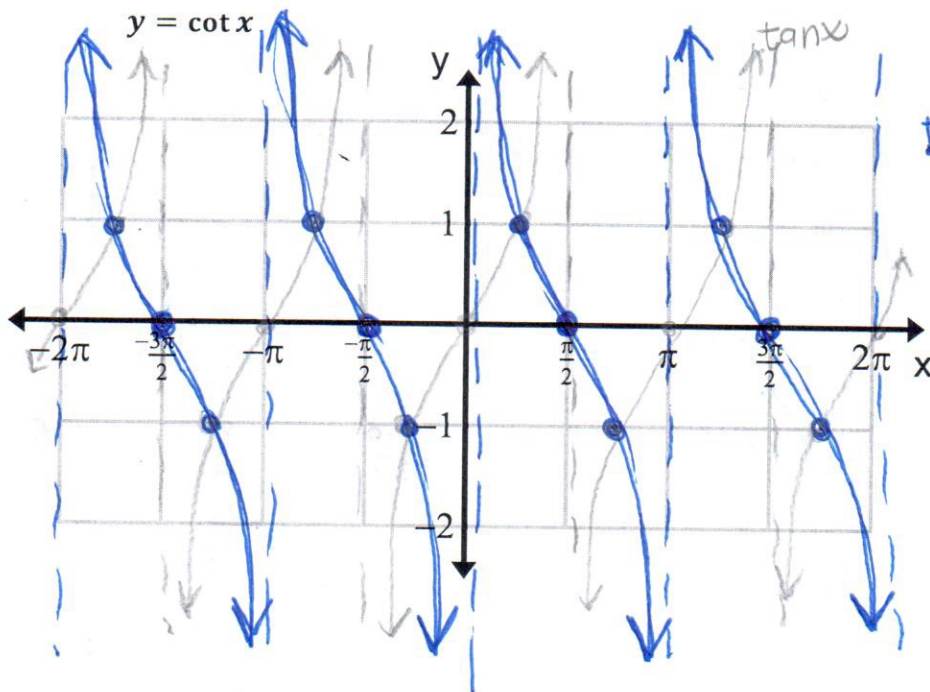| $csc\ x = \dfrac{1}{sinx}$ OR $\dfrac{1}{y}$	$sec\ x = \dfrac{1}{cosx}$ OR $\dfrac{1}{x}$	$cot\ x = \dfrac{1}{tanx}$ OR $\dfrac{cosx}{sinx}$ OR $\dfrac{x}{y}$

Graphing the co-functions.

Graph the following by hand. List the domain and range of each.

$y = csc\ x$

D: all x; $x \neq 0 + n\pi$
R: $(-\infty, -1] \cup [1, \infty)$
per: 2π
amp: NONE

$y = sec\ x$

D: all x; $x \neq \dfrac{\pi}{2} + n\pi$
R: $(-\infty, -1] \cup [1, \infty)$
per: 2π
amp: NONE

$y = cot\ x$

D: all x;
   $x \neq 0 + n\pi$
R: $(-\infty, \infty)$
per: π
amp: NONE