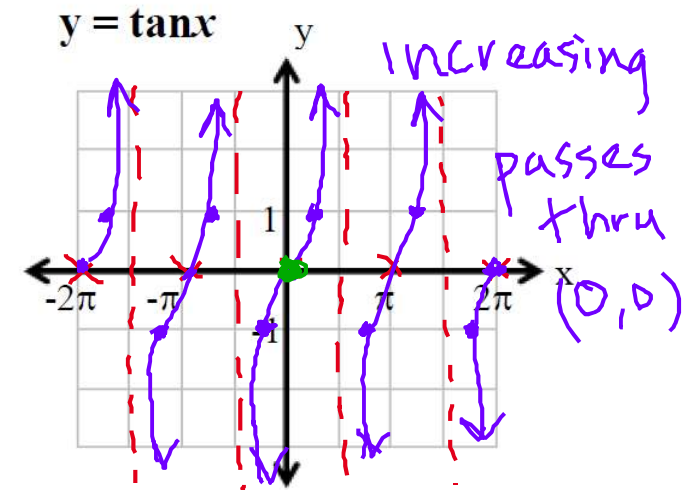
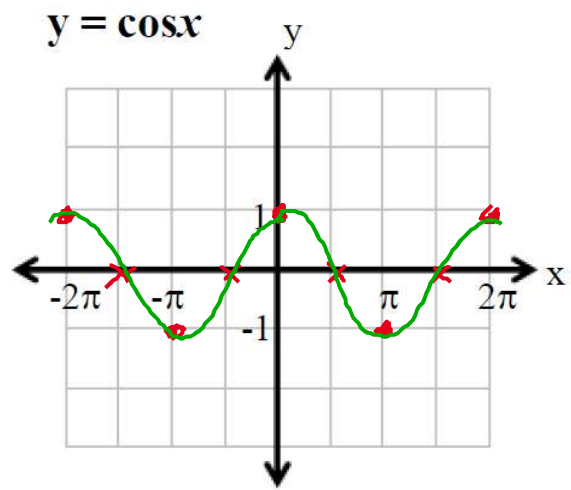
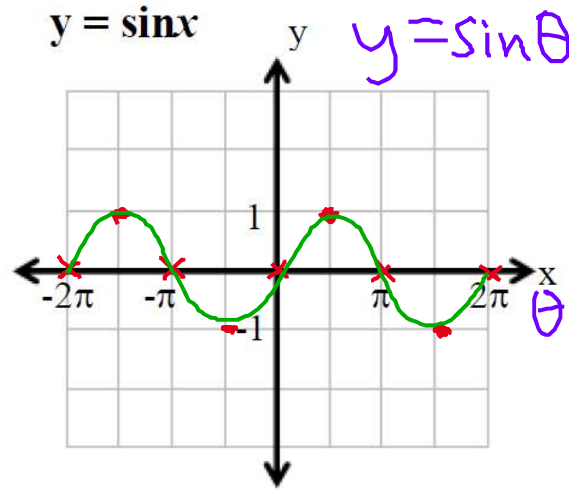


Notes: 5.4

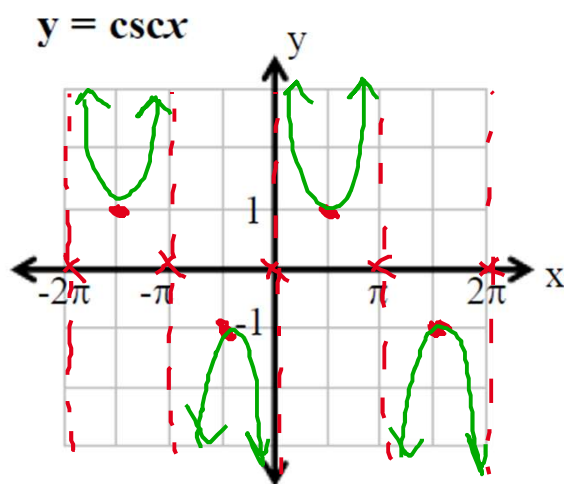
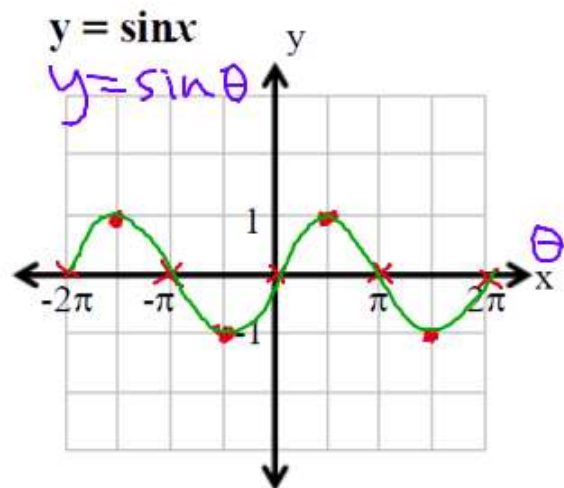
SKETCH A GRAPH FOR THE SIX TRIG FUNCTIONS USING 5 "KEY" VALUES FOR EACH PERIOD.



Domain: $x = \mathbb{R}$
 Range: $-1 \leq y \leq 1$
 Period: 2π (per $\frac{2\pi}{k}$)
 x-intercepts: $\dots -2\pi, -\pi, 0, \pi, 2\pi \dots$

Domain: $x = \mathbb{R}$
 Range: $-1 \leq y \leq 1$
 Period: 2π
 x-intercepts: $\dots, -\frac{3\pi}{2}, -\frac{\pi}{2}, \frac{\pi}{2}, \frac{3\pi}{2} \dots$

Domain: $x = \mathbb{R}$, except $\frac{\pi}{2}n$
 Range: $y = \mathbb{R}$
 Period: π
 Asymptotes: $\dots, \frac{3\pi}{2}, \frac{\pi}{2}, \frac{\pi}{2}, \frac{3\pi}{2} \dots$
 $n = \text{odd integer}$
(per $\frac{\pi}{k}$)



Domain: $x = \mathbb{R}$, except πn , $n = \text{integer}$

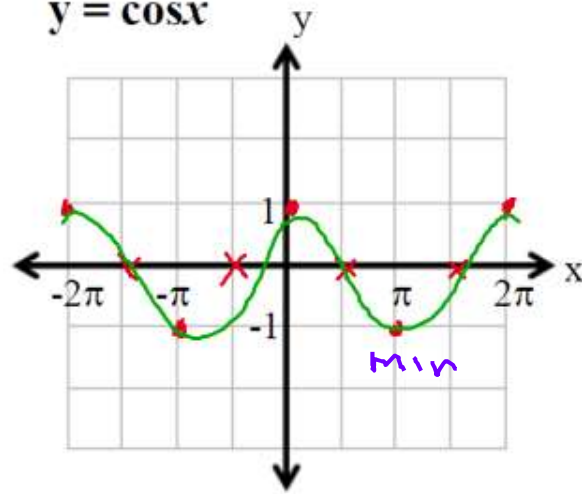
Range: $y \geq 1$
 $y \leq -1$

Period: 2π

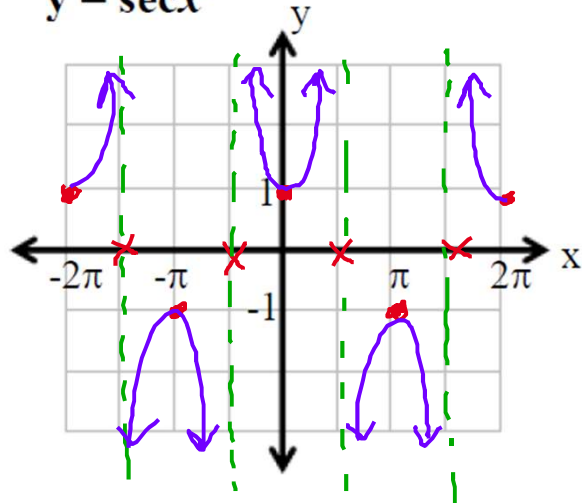
x-intercepts: none

graph never crosses mid-line

$$y = \cos x$$



$$y = \sec x$$



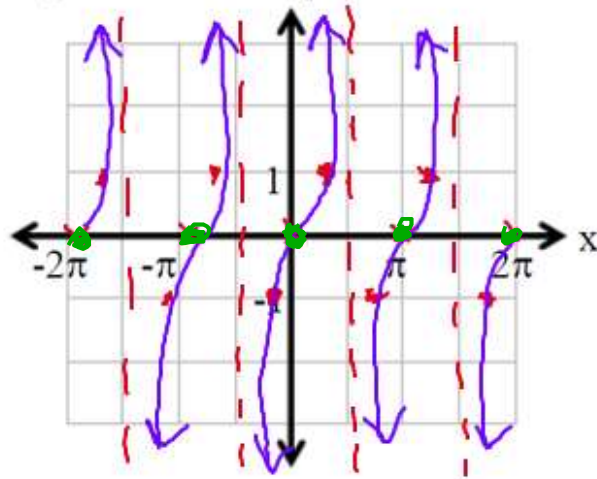
Domain: $x = \mathbb{R}$, except $\frac{\pi}{2} n$

Range: $y \geq 1, y \leq -1$

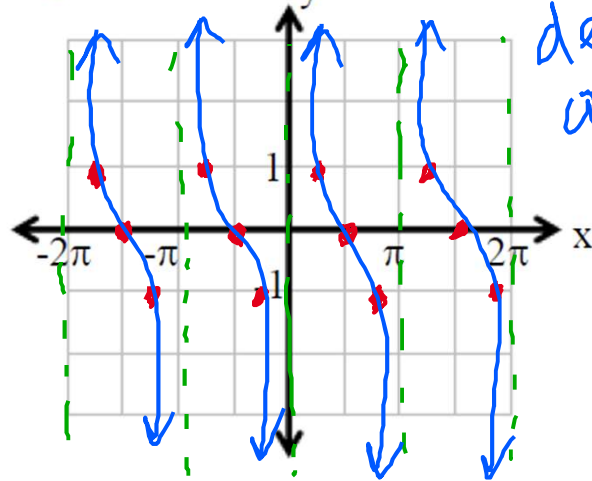
Period: 2π

x-intercepts: none

$y = \tan x$



$y = \cot x$



decreasing asymptote at $(0,0)$

- Domain: $x = \mathbb{R}$, except πn
- Range: $y = \mathbb{R}$
- Period: π
- Asymptotes: $-2\pi, -\pi, 0, \pi, 2\pi$

Notes 5-4: Graphing tan/cot and sec/csc

Tangent (parent) graph: increasing, passes through origin.

Cotangent (parent graph): decreasing, asymptote at origin.

The reciprocal of zero is an undefined value.

The reciprocal of an undefined value is zero.

A horizontal shift will move key points and the asymptotes left/right.

Asymptotes get closer together or further apart as the period changes.

A negative A value will reflect (flip) the graph across the x-axis.

factored/graphing form:

$$y = \mathit{t}ank(x - b) + h$$

$$y = \mathit{c}otk(x - b) + h$$

$$\text{period} = \frac{\pi}{k}, k > 0$$

b = horizontal shift

h = vertical shift

amplitude = NONE!

*(key points just stretch
or get compacted by A)*

factored/graphing form:

$$y = \mathit{s}eck(x - b) + h$$

$$y = \mathit{c}sck(x - b) + h$$

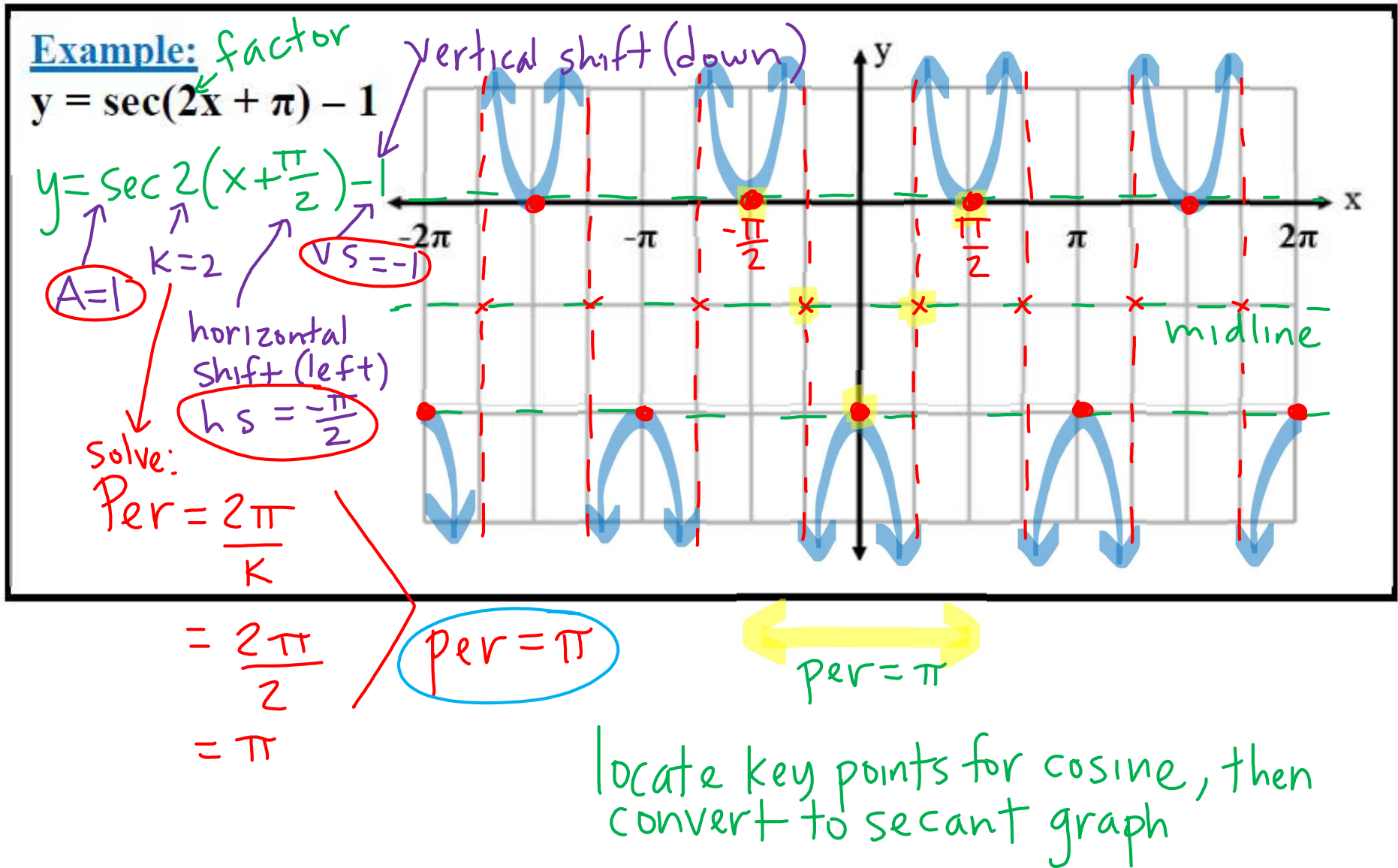
$$\text{period} = \frac{2\pi}{k}, k > 0$$

b = horizontal shift

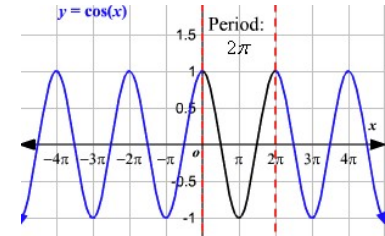
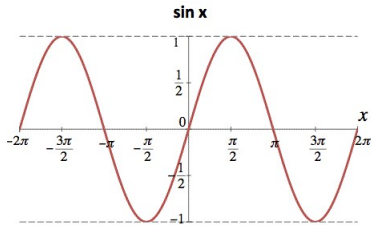
h = vertical shift

amplitude = NONE!

*(key points just stretch
or get compacted by A)*



Always write in factored/graphing form before identifying the horizontal shift.



No homework

**unless you need to finish
yesterday's assignment
(Extra Practice Sine/Cosine)**