

# Graphing!!!! ☺

- $\sin x$ ,  $\cos x$ ,  $\sec x$ , &  $\csc x$   
all have period  $2\pi$
- $\tan x$  &  $\cot x$  have period  $\pi$
- $\sin x$  &  $\cos x$  have amplitude 1
- $\sec x$ ,  $\csc x$ ,  $\tan x$ , &  $\cot x$   
all have key reference points  
w/ y-values 1 & -1

$$y = f(x) \longrightarrow y = a f(bx)$$

$$y = a \cdot f(x)$$

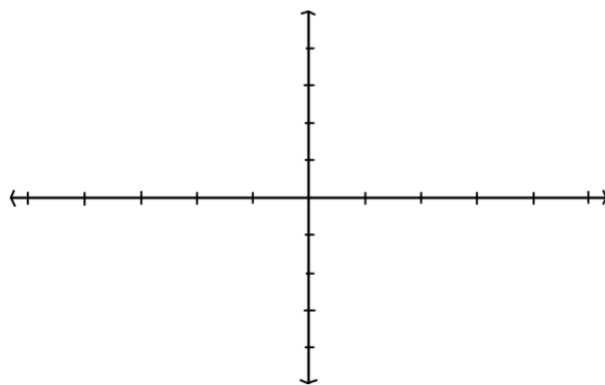
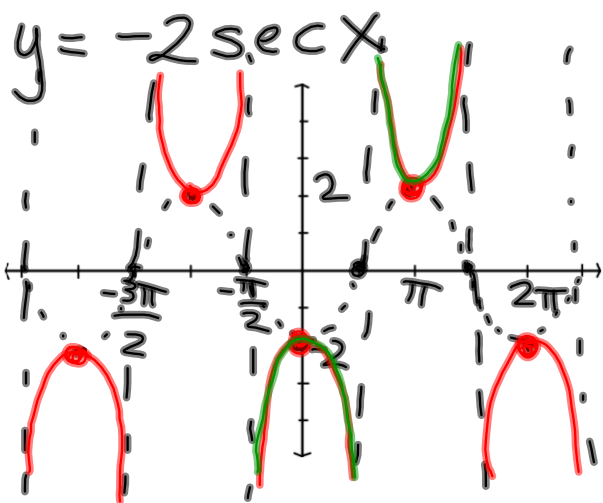
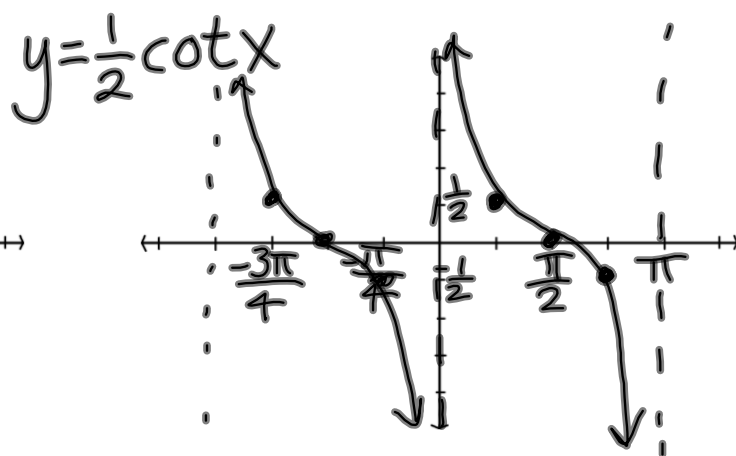
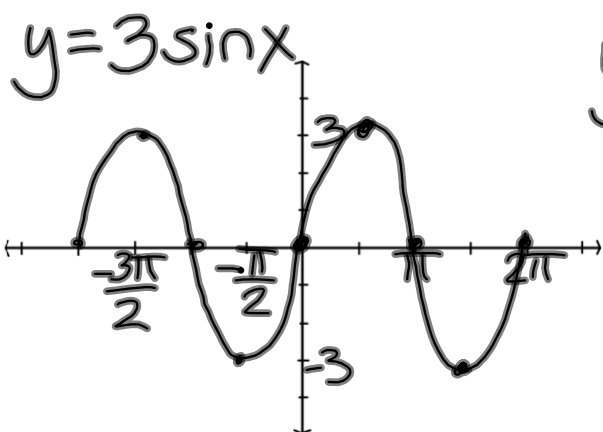
$a$  yields a vertical shrink/stretch

If  $|a| > 1 \Rightarrow$  stretch

If  $|a| < 1 \Rightarrow$  shrink

For  $\sin x$  &  $\cos x$ ,

$$\underline{\text{amplitude}} = |a|$$



$$y = f(bx)$$

$b \Rightarrow$  horizontal shrink/stretch

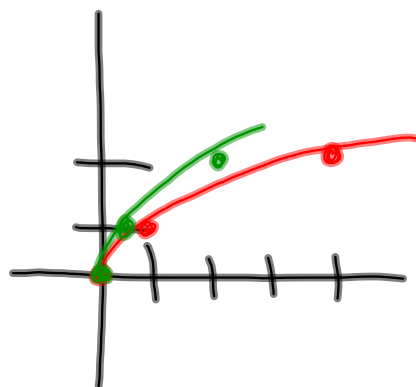
$$y = \sqrt{x}$$

v.

$$y = \sqrt{2x}$$

x	$\sqrt{x}$
4	2
1	1

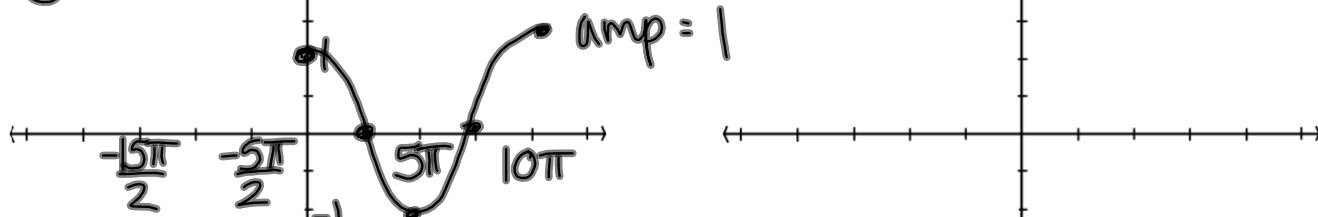
x	2x	$\sqrt{2x}$
2	4	2
$\frac{1}{2}$	1	1



period of a trigonometric function:

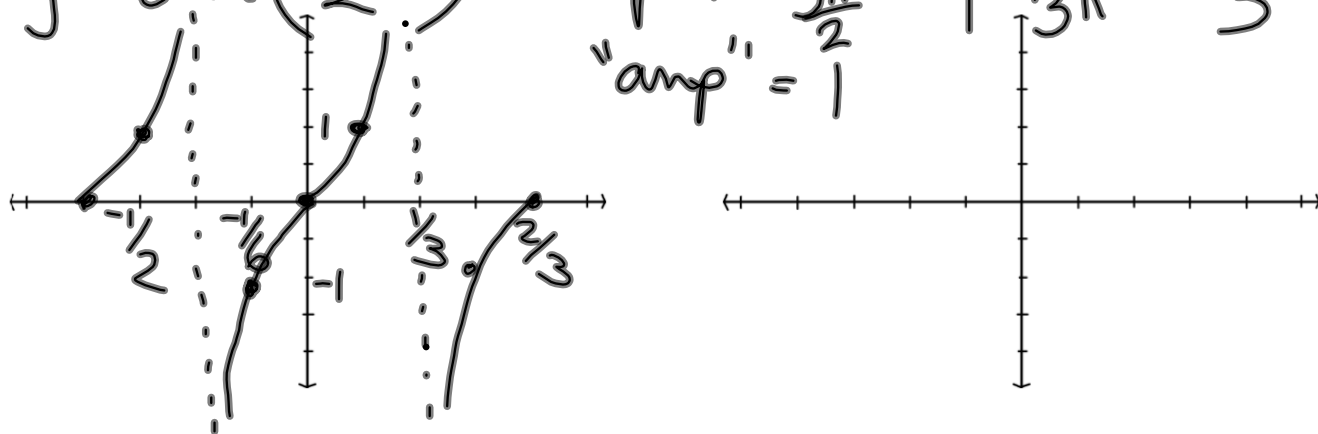
$$\text{period} = \frac{\text{original period } (\pi \text{ or } 2\pi)}{|b|}$$

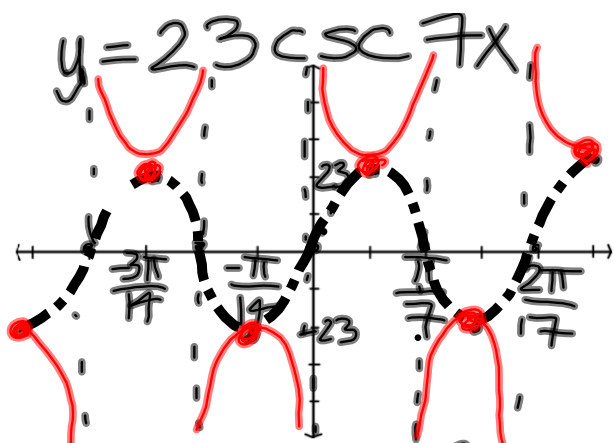
$y = \cos\left(\frac{1}{5}x\right)$       per =  $\frac{2\pi}{\frac{1}{5}} = 2\pi \cdot \frac{5}{1} = 10\pi$



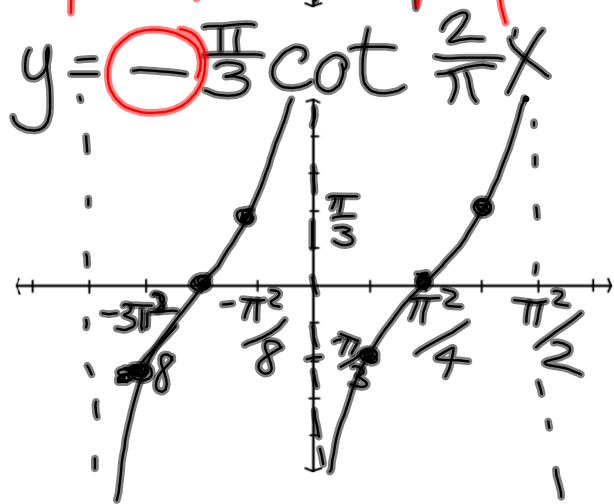
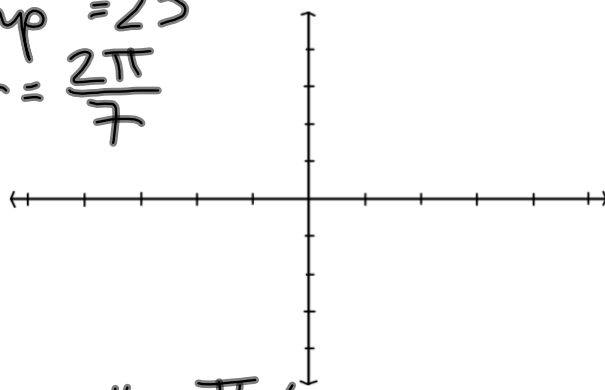
$y = \tan\left(\frac{3\pi}{2}x\right)$

per:  $\frac{\pi}{\frac{3\pi}{2}} = \frac{\pi}{1} \cdot \frac{2}{3\pi} = \frac{2}{3}$   
 "amp" = 1

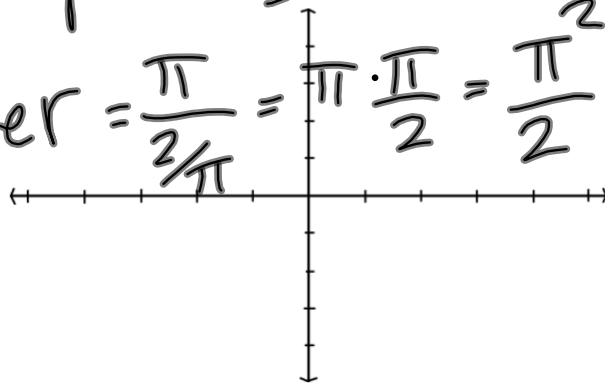


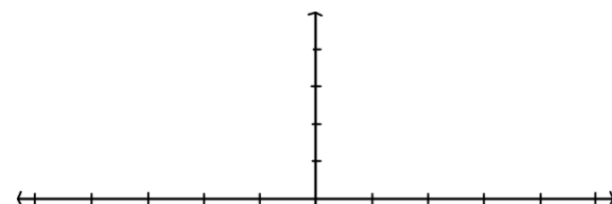
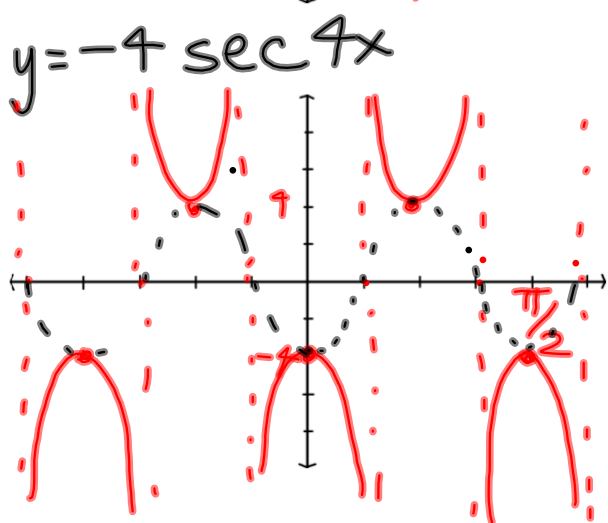
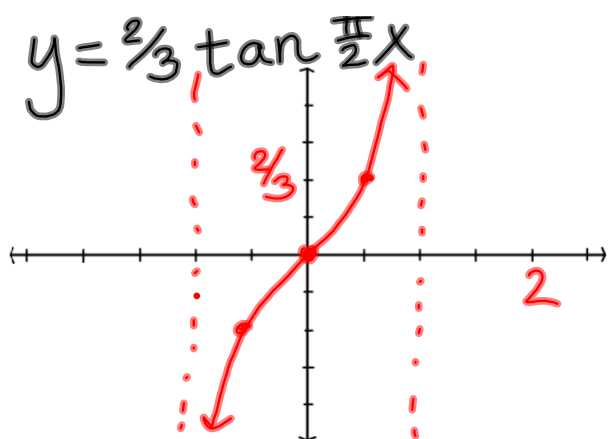


"amp" = 23  
 per =  $\frac{2\pi}{7}$



"amp" =  $\frac{\pi}{3}$   
 per =  $\frac{\pi}{2/\pi} = \pi \cdot \frac{\pi}{2} = \frac{\pi^2}{2}$





$y = a f(bx)$

**Homework:**  
**Graphing worksheet**  
**problems through #28**  
**[ all functions of the form**  
 **$y = af(bx)$  ]**

