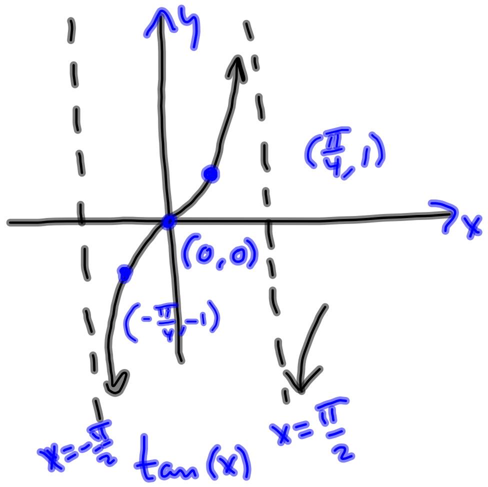
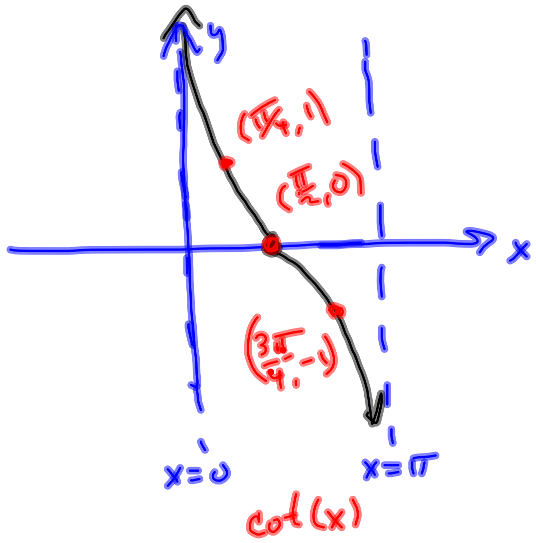
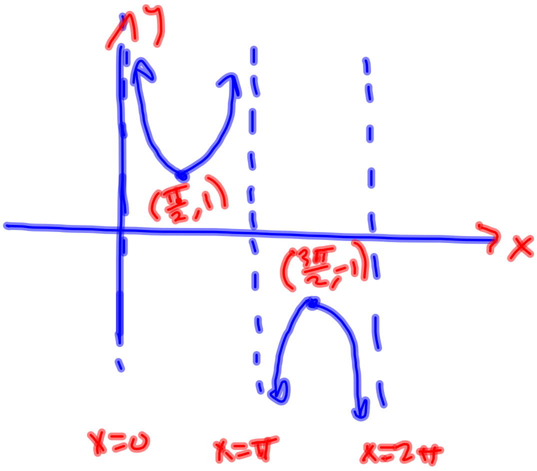


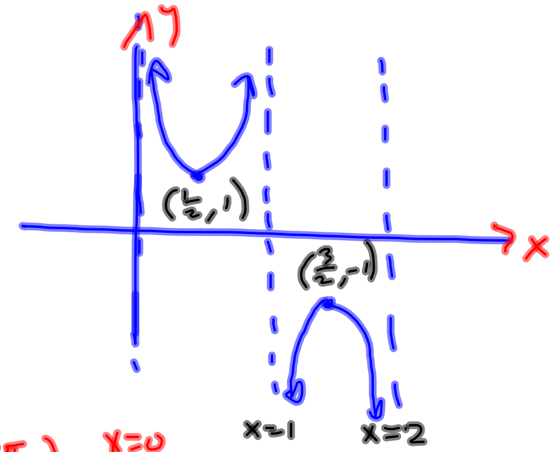




$$\underline{\underline{f(x) = \csc(x)}}$$

$$\csc(\pi x) = f(\pi x)$$

$$(x,y) \longmapsto \left(\tfrac{1}{\pi}x, y\right)$$



$(\frac{\pi}{2},1)$

$(\frac{3\pi}{2},-1)$ $x=0$

$$\left(\frac{\pi}{2},1\right) \longrightarrow \left(\frac{1}{2},1\right)$$

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

① stretches/shrinks $af(x)$, $f(bx)$

② Rigid Translations $f(x)+d$, $f(x+c)$

$$\tan(4x-\pi) = \tan\left(4\left(x-\frac{\pi}{4}\right)\right)$$

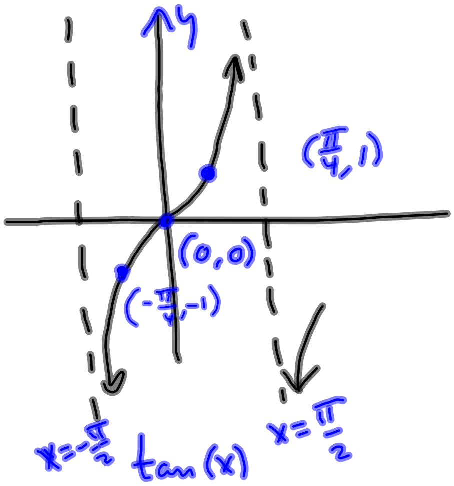
$$\tan(x) \longrightarrow \tan(4x) \longrightarrow \tan\left(4\left(x-\frac{\pi}{4}\right)\right)$$

$(x,y) \longmapsto \left(\frac{1}{4}x, y\right)$

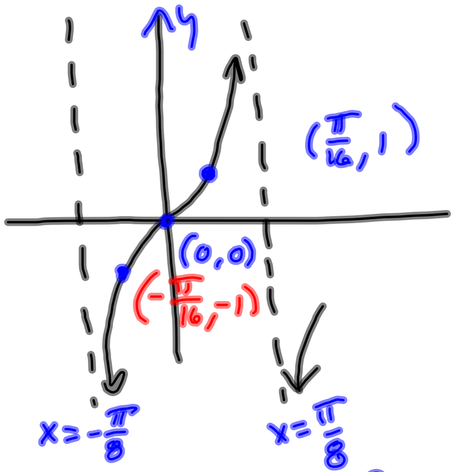
$\frac{1}{4}x$'s

$(x,y) \longmapsto \left(x+\frac{\pi}{4}, y\right)$

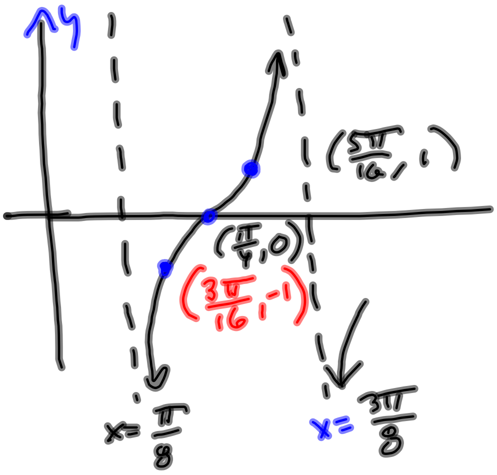
Right $\frac{\pi}{4}$



$\tan(x) = f(x)$



$\tan(4x) = f(4x)$



$$-\frac{\pi}{8} + \frac{\pi}{4} = \frac{-\pi+2\pi}{8} = \frac{\pi}{8}$$

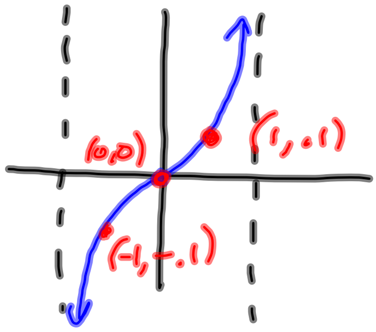
$$-\frac{\pi}{16} + \frac{\pi}{4} = \frac{-\pi+4\pi}{16} = \frac{3\pi}{16}$$

$\left(-\frac{\pi}{16}, -1\right)$

$$\tan\left(4\left(x-\frac{\pi}{4}\right)\right) = f\left(4\left(x-\frac{\pi}{4}\right)\right)$$

Right $\frac{\pi}{4}$

$$y = 0.1\tan\left(\frac{\pi}{4}x + \frac{\pi}{4}\right)$$
$$= 0.1\tan\left(\frac{\pi}{4}(x+1)\right)$$



$x=-2$ $\quad$ $x=2$

$f(x) = \tan(x)$

$.1f(x) = .1\tan(x)$

$.1f\left(\frac{\pi}{4}x\right) = .1\tan\left(\frac{\pi}{4}x\right)$

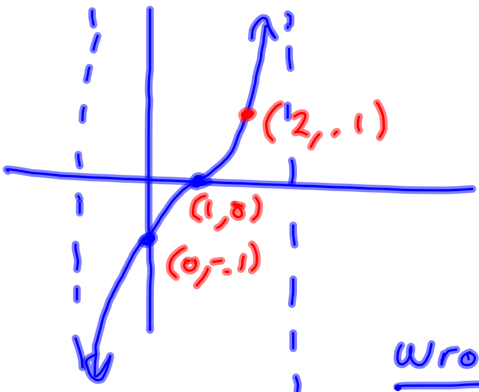
$\left(\frac{\pi}{4}, 1\right) \longmapsto (1, .1)$

$(x,y) \longmapsto \left(\frac{4}{\pi}x, .1y\right)$

$$\frac{\frac{\pi}{4}}{\frac{\pi}{4}} = 1$$

$$.1\tan\left(\frac{\pi}{4}x\right) \longrightarrow .1\tan\left(\frac{\pi}{4}(x+1)\right)$$

$$\frac{\frac{\pi}{2}}{\frac{\pi}{4}} = 2$$



I combined the horizontal & vertical compressions into one step.

$x=-1$ $\quad$ $x=3$

$.1\tan\left(\frac{\pi}{4}(x-1)\right)$

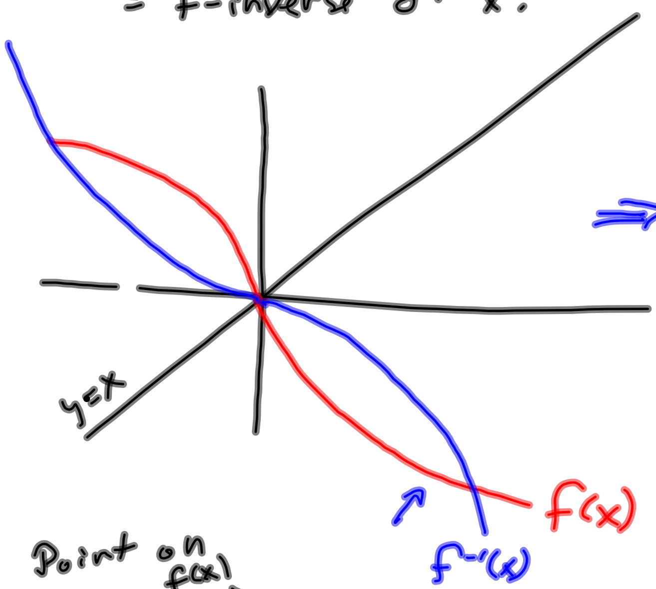
Wrong! I went right instead

$y = f(x)$

$y = f^{-1}(x)$

= f-inverse of x.

§ 1.6 Due Friday

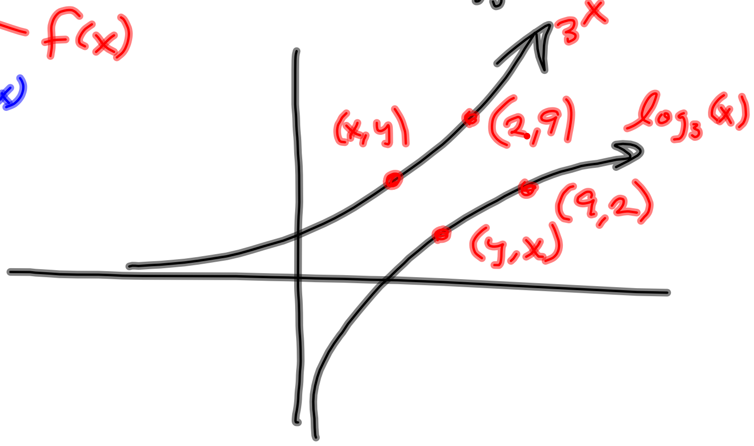


$f(x)$ is 1-to-1

$\Longrightarrow f^{-1}(x)$ is a function.

$f(x) = 3^x \Longrightarrow$

$f^{-1}(x) = \log_3(x)$



Point on f(x)

$(x, f(x))$

$\rightarrow (f(x), x)$ is point on $f^{-1}(x)$