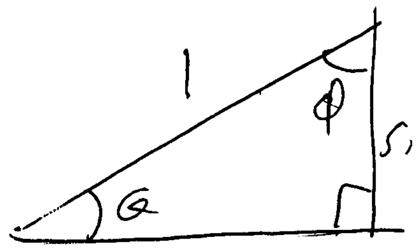


$\sin\theta = x$

$\theta = \sin^{-1}(x)$

$\cos\theta = \sqrt{1-x^2}$

$\cancel{\tan}$ $\cos(\sin^{-1}(x)) = \sqrt{1-x^2}$

$\tan(\sin^{-1}(x)) = \dfrac{x}{\sqrt{1-x^2}}$

$\cot \quad = \dfrac{\sqrt{1-x^2}}{x}$

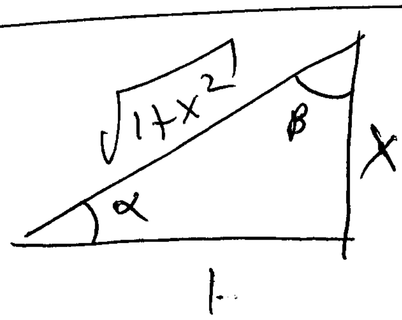
$\cos(\phi) = x$

$\phi = \dfrac{\pi}{2} - \theta$

$\sec = 1/\sqrt{1-x^2}$

$\phi = \boxed{\cos^{-1}(x) = \dfrac{\pi}{2} - \sin^{-1}(x)}$

$\csc = 1/x$



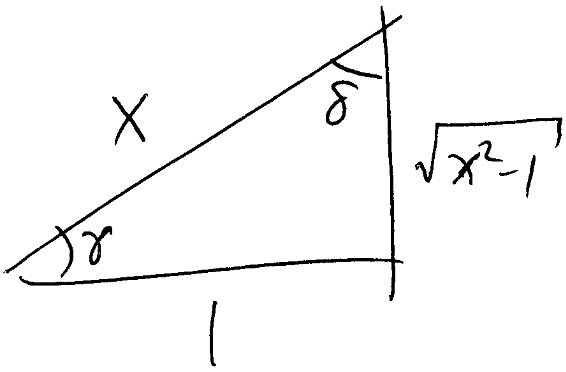
$\tan(\alpha) = x$

$\alpha = \tan^{-1}(x)$

$\cot(\beta) = x$

$\beta = \cot^{-1}(x) = \pi/2 - \alpha$

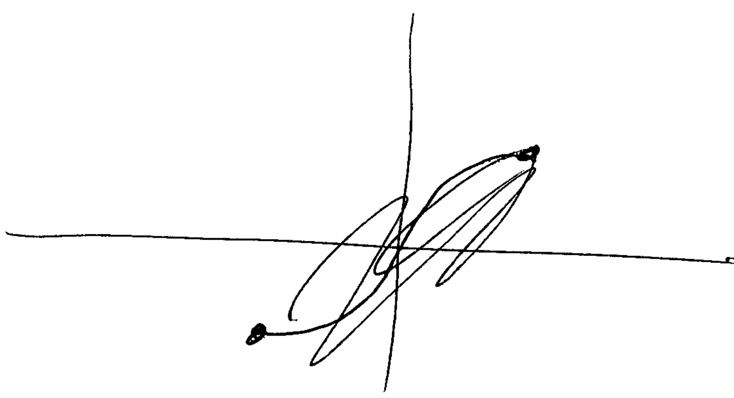
$= \pi/2 - \tan^{-1}(x)$

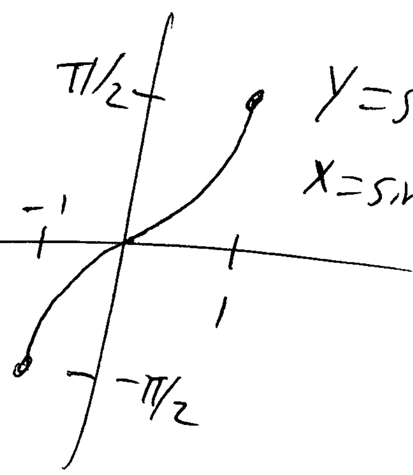


$\sec \gamma = x$

$\gamma = \sec^{-1}(x)$

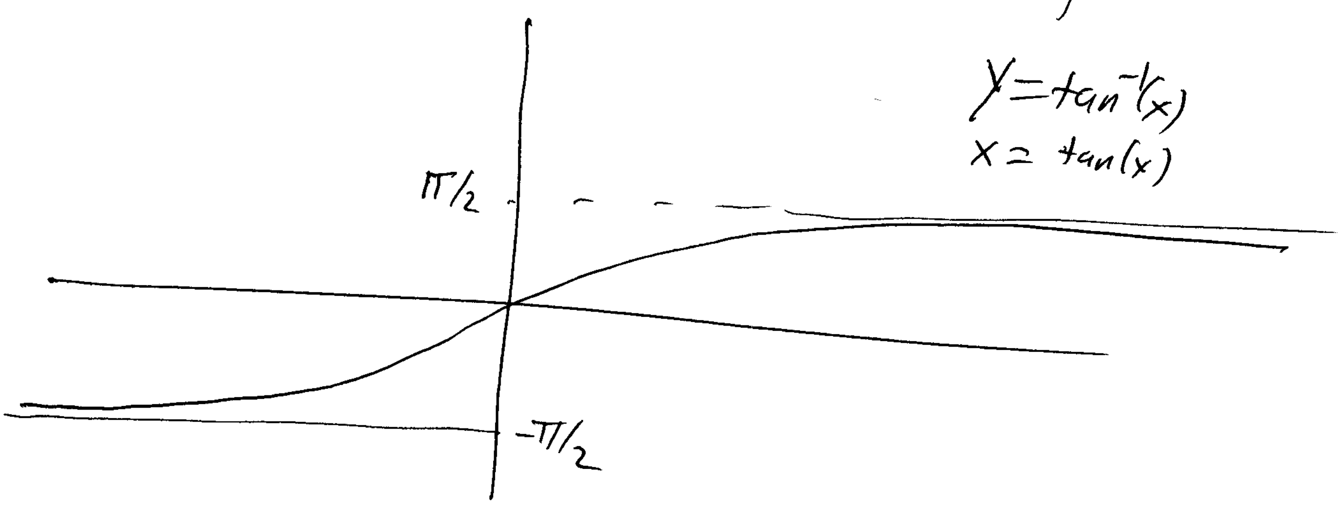
$\delta = \csc^{-1}(x) = \frac{\pi}{2} - \sec^{-1}(x)$





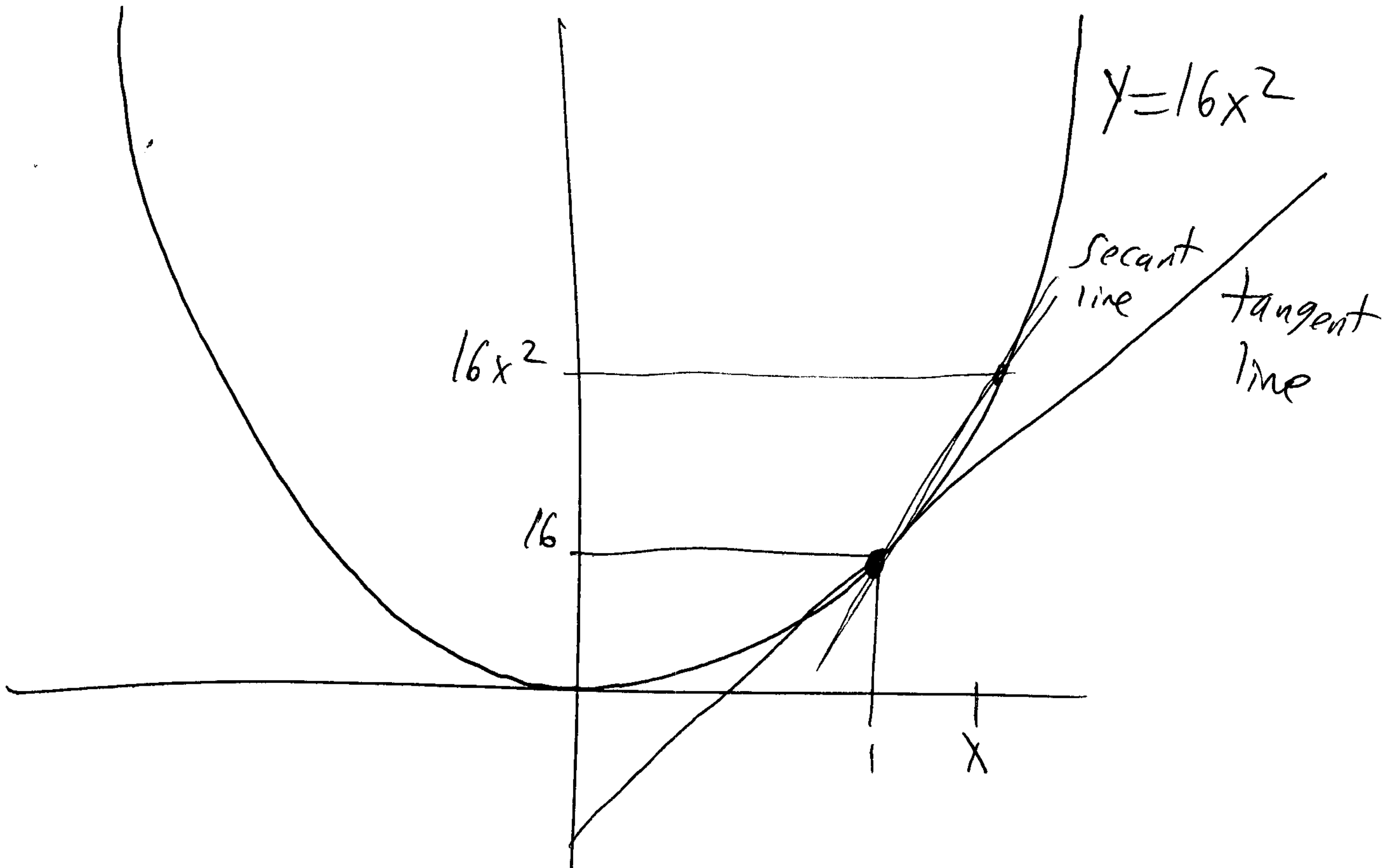
$y = \sin^{-1}(x)$

$x = \sin(y)$



$y = \tan^{-1}(x)$

$x = \tan(x)$



rise $= 16x^2-16$

run $= X-1$

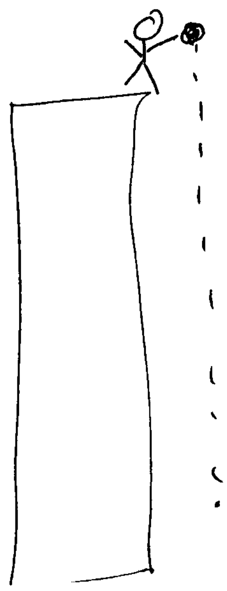
Slope of Secant line

$$= \frac{16x^2-16}{x-1}$$

X	$\frac{16x^2-16}{X-1}$
2	48
1.5	40
1.1	33.6
1.01	32.16
1.001	32.016

Slope of tangent line.

$$= \lim_{X\to 1} \frac{16x^2-16}{X-1}$$



x = distance it fall

$x = 16t^2$

~~tx~~	~~t~~ x
0	
.98	
.99	
1	16
1.01	16.3216
1.1	19.36
1.5	36
2	64

16
1.21

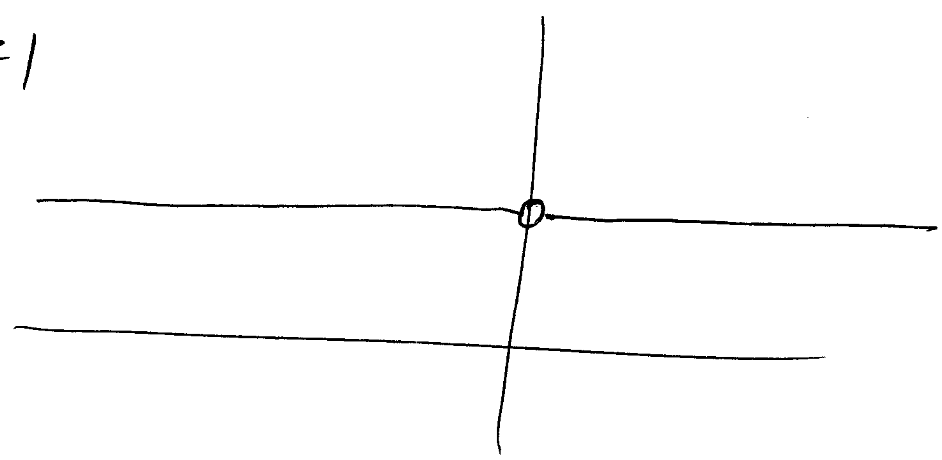
instantaneous velocity at $t=1$

$$= \lim_{t \to 1} \frac{16t^2 - 16}{t-1}$$

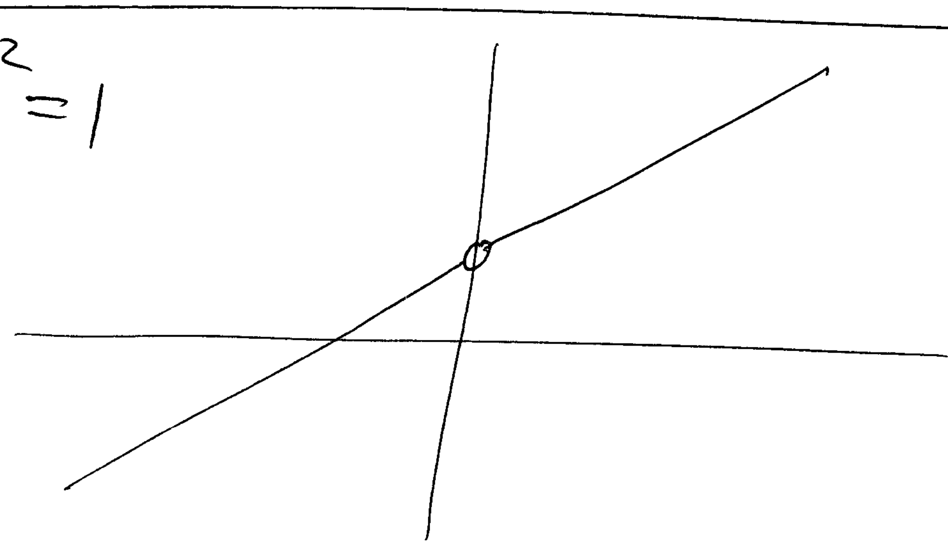
"$\lim_{x \to a} f(x) = L$" means

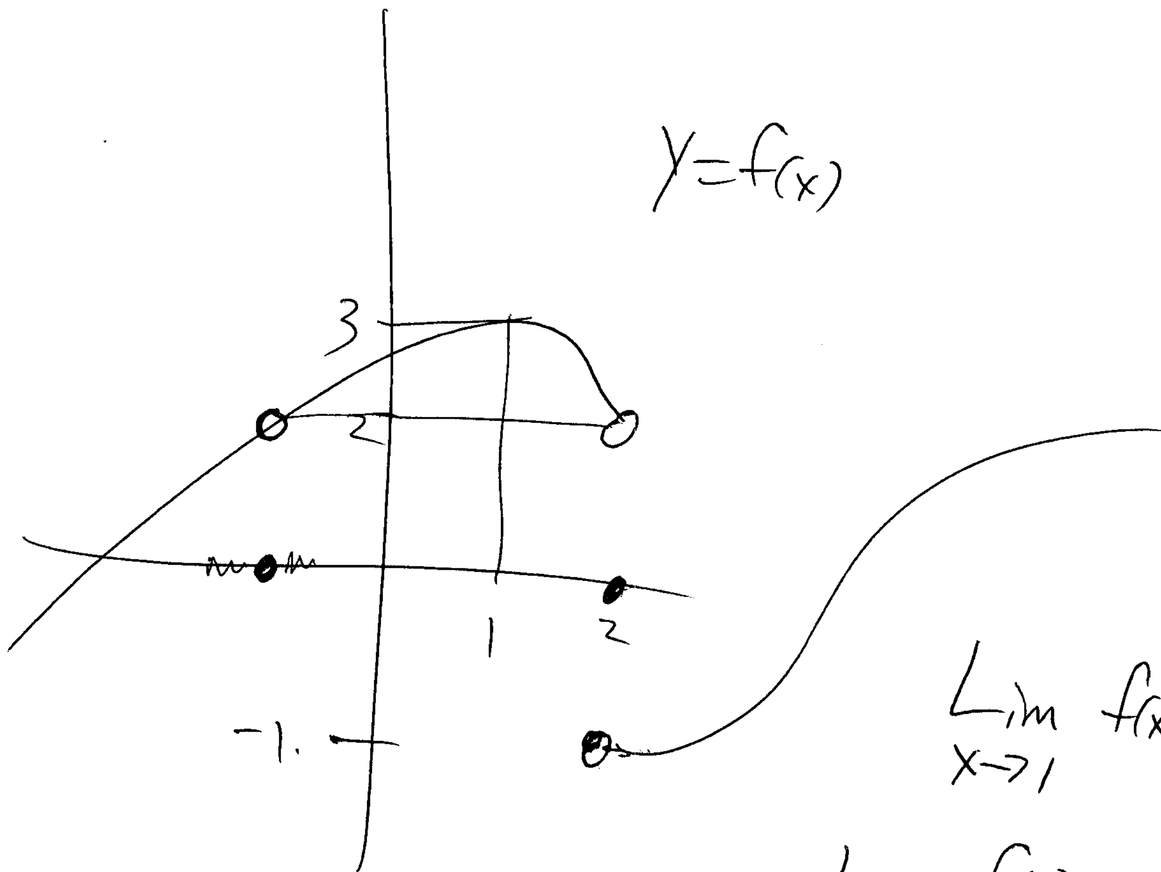
"Whenever x is close to a (but not $= a$) $f(x)$ is close to L"

$\lim_{x \to 0} \frac{x}{x} = 1$



$\lim_{x \to 0} \frac{x + x^2}{x} = 1$





$$\lim_{x\to 1} f(x) = 3$$

$$\lim_{x\to 2} f(x) = DNE$$

$$\lim_{x\to 2^-} f(x) = 2$$

$$\lim_{x\to -1} f(x) = 2$$

$$\lim_{x\to 2^+} f(x) = -1$$

One-sided limits.

"$\lim_{x\to a^-} f(x) = L$" means "Whenever x is slightly less than a, then $f(x)$ is close to L"

"$\lim_{x\to a^+} f(x) = L$" means "Whenever x is slightly bigger than a, $f(x)$ is close to L"

" $\lim_{x \to a} f(x) = +\infty$ " means

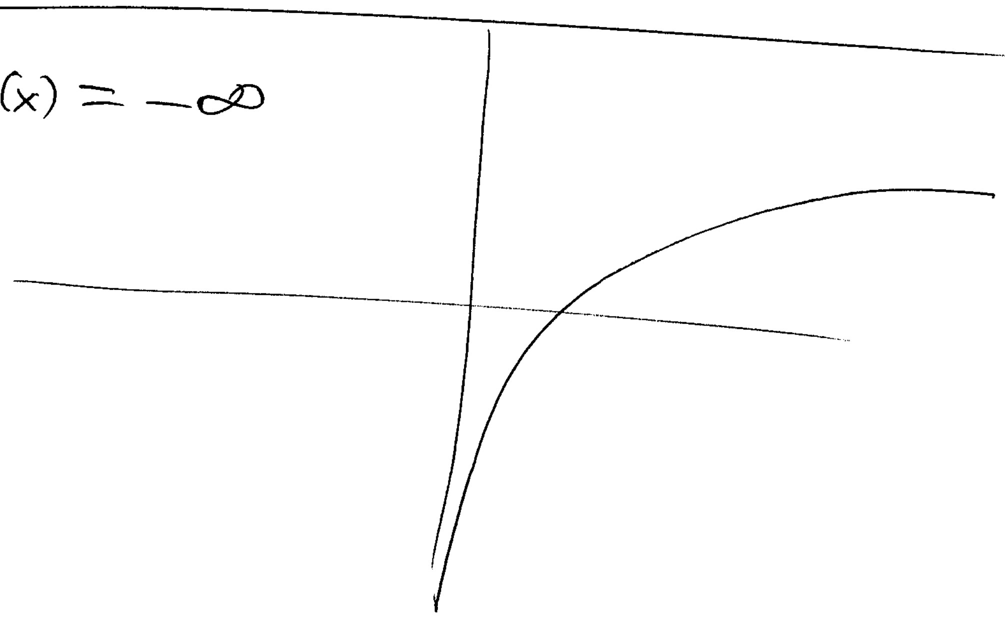
"Whenever x is close to a (but not $= a$), $f(x)$ is large & positive

$\lim_{x \to 0} \frac{1}{x^2} = +\infty$

$\lim_{x \to 0^+} \frac{1}{x} = +\infty$

$\lim_{x \to 0^-} \frac{1}{x} = -\infty$

$\lim_{x \to 0^+} \ln(x) = -\infty$



"$\lim_{x \to \infty} f(x) = L$" means

"Whenever x is large & positive, $f(x) \approx L$"

$$\lim_{x \to \infty} \tan^{-1}(x) = \pi/2$$

"$\lim_{x \to -\infty} f(x) = L$" means

"whenever x is large & neg, $f(x) \approx L$"

$\text{Lim} \quad f(x) = L$

$x \to a$ $\qquad -\infty$

$x \to a^+$

$x \to a^-$ $\qquad +\infty$

$x \to \infty$

$x \to -\infty$