Precalc15.5

Find derivative of e^x

Find derivative of ln[x]

Find derivative of sin(x) and cos(x)

product

derivative

first derivative

differentiation

friendly functions

graphing calculator

slope tan lim

$y = x^2 + 3x^1$

$y' = 2x + 3$

$f(x)$ $f'(x)$

y y' $\frac{dy}{dx}$

$y = e^x$ $y' = e^x$

Calculator:

Graph $y = e^x$

Draw tangent line

(x,y)	eq tan line	slope tan line
(0, 1)	$y = 1x + 1$	1
(1, 2.7)	$y = 2.72x - 4.53$	2.72
(2, 7.4)	$y = 7.39x - 7.39$	7.39

$y' = \frac{1}{x}$

Graph y = ln(x) (recip.?)

(x,y)	tan line	slope tan line
(1,0)	$y = 1x - 1$	1
(2,0.7)	$y = \frac{1}{2}x - 0.3$	$\frac{1}{2}$
(3,)	$y = \frac{1}{3}x$	$\frac{1}{3}$

Graph y=sin(x)

radians!

(x,y) equation	slope tan line
$\left(\frac{\pi}{6}, \right.$ 30° $\left.\right)$ $y' = \cos x$	$0.8660 \left(\cos \frac{\pi}{6}\right)$
$\left(\frac{\pi}{4}, \right.$ 45° $\left.\right)$	$0.7071 \left(\cos \frac{\pi}{4}\right)$
$\left(\frac{\pi}{3}, \right.$ 60° $\left.\right)$	$0.5 \left(\cos \frac{\pi}{3}\right)$

Graph y=cos(x) radians!

(x,y) equation slope

$y = -\sin x$

But isn't 1st derivative = slope of tan line?

$f(x)$	$f'(x)$	
Friendly functions		
$y=e^x$	e^x	
$y=\ln(x)$	$\frac{1}{x}$	
$y=\sin x$	$\cos x$	radians
$y=\cos x$	$-\sin x$	

$y = x^3 + 3x^2 \ldots$

$y = 3\sin x \qquad y' = 3\cdot\cos x$

$y = -5e^x \qquad y' = -5e^x$

$y = x^2 + \ln x \qquad y' \; 2x + \frac{1}{x}$

~~$x^2(\sin x)$~~