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

$$f(x) = \tan x \quad f'(x) = \sec^2 x$$

$$y = \sec x \qquad \frac{dy}{dx} = \sec x \tan x$$

$$f(x) = \cos x \quad f'(x) = -\sin x$$

$$y = \cot x \qquad y' = -\csc^2 x$$

$$y = \csc x \qquad \frac{dy}{dx} = -\csc x \cot x$$

$$y = x^n \qquad y' = nx^{n-1}$$

$$h(x) = f(x)g(x) \qquad h'(x) = f(x)g'(x) + g(x)f'(x)$$

$h'(x)$ = "first times derivative of second plus second times the derivative of the first"

h′(x)= 1D2 +2D1

$$h(x) = \frac{f(x)}{g(x)} \qquad h'(x) = \frac{g(x)f'(x) - f(x)g'(x)}{(g(x))^2}$$

$$h'(x) = \frac{\text{bottom derivative of top-top derivative of bottom}}{\text{bottom}^2}$$

$$h'(x) = \frac{\text{Lo dHi -Hi dLo}}{\text{Lo}^2}$$

$$h(x) = f(g(x)) \qquad h'(x) = f'(g(x))g'(x)$$

$h'(x)$ = "derivative of the outside times the derivative of the inside"

$$f(x) = e^u \qquad f'(x) = e^u \frac{du}{dx}$$

$$y = \ln u \qquad \frac{dy}{dx} = \frac{1}{u}\frac{du}{dx}$$

Different notations for derivative

$f'(x)$

$\frac{dy}{dx}$

y'

Different names for the derivative

Instantaneous Rate of Change
Slope of the tangent line
Slope of the curve

Definition of the derivative

$$\lim_{h \to 0} \frac{f(x+h) - f(x)}{h}$$