Review: Derivatives:

Monday, January 8, 2018 10:24 AM

$$\frac{d}{dx}(\sin x) = \cos x$$

$$\frac{d}{dx}(\cos x) = -\sin x$$

$$\frac{d}{dx}(e^x) = e^x$$

$$\frac{d}{dx}(\ln x) = \frac{1}{x}$$

$$\frac{d}{dx}(\tan x) = \sec^2 x$$

method #1: look it up

method #2: (if you insist) memorize it

method #3: (if you really insist)

$$\tan x = \frac{\sin x}{\cos x}$$

and use quotient rule

similarly: $\frac{d}{dx}(a^x)$ → if you need it, look it up

$$\frac{d}{dx}(\sin 4x) = 4\cos 4x$$ (chain rule)

$$\frac{d}{dx}(e^{2x^2+3}) = 4x\, e^{2x^2+3}$$

$$\frac{d}{dx}\left(e^{2x^2+3}\right) = 4x\, e^{2x^2+3}$$

$$\frac{d}{dx}\left(\ln(\cos x)\right) = \frac{1}{\cos x}\cdot(-\sin x) = -\tan x$$

Review: Differentials

if $y = x^2$, what is dy?

recall: $dy = \frac{dy}{dx}\cdot dx$

$dy = 2x\,dx$

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if $u = \ln x$, $du = \frac{1}{x}\,dx$ $\left(\frac{dx}{x}\right)$

if $y = e^x$, $dy = e^x\,dx$

$y = \sin x$, $dy = \cos x\,dx$

$u = x^2 + x$, $du = (2x+1)\,dx$