Today's Topic: Derivatives of logarithmic and exponential functions

$\frac{d}{dx}\left(e^{\square}\right)=e^{\square}\cdot d\square$	$\frac{d}{dx}\left(b^{\square}\right)=b^{\square}\cdot d\square\cdot\ln b$	$\frac{d}{dx}\left(\ln\square\right)=\frac{d\square}{\square}$	$\frac{d}{dx}\left(\log_b\square\right)=\frac{d\square}{\square\cdot\ln b}$

In-Class Examples:

Ex. 1 Evaluate each derivative.

a. $\frac{d}{dx}\left[e^{2x^2-3x}\right]$

$e^{2x^2-3x}\cdot d\left[2x^2-3x\right]$

$e^{2x^2-3x}(4x-3)$

b. $\frac{d}{dx}\left[4^{\sin x}\right]$

$4^{\sin x}\cdot\cos x\cdot\ln 4$

c. $\frac{d}{dx}\left[xe^{x}\right]$

$xe^{x}+e^{x}$

Ex. 2 Evaluate each derivative.

a. $\frac{d}{dx}\left[\ln\left(x^2+1\right)\right]$

$\frac{2x}{x^2+1}$

b. $\frac{d}{dx}\left[\log_3\left(x^2-5x+1\right)\right]$

$\frac{2x-5}{(x^2-5x+1)\cdot\ln 3}$

c. $\frac{d}{dx}\left[\left(\ln x\right)^3\right]$

$3(\ln x)^2\cdot\frac{1}{x}$

AP Multiple Choice

None

Homework: Worksheet 36