Lesson 50

Derivatives of Composite functions

$$\frac{d}{dx}e^{(\ )} = e^{(\ )}\frac{d}{dx}(\ ) \qquad \frac{d}{dx}(\ )^n = n(\ )^{n-1}\frac{d}{dx}(\ )$$

$$\frac{d}{dx}\sin(\ ) = \cos(\ )\frac{d}{dx}(\ ) \qquad \frac{d}{dx}\ln(\ ) = \frac{1}{(\ )}\frac{d}{dx}(\ )$$

- $f(x) = \cos(2x^2 + 4x + 6)$
- $f(x) = e^{\sin^5(x)}$
- $f(x) = \tan(\ln(x^3 + 4x + 3))$
- $f(x) = (x^3 - 2x)^{25}(x+3)^{10}$
- $f(x) = \dfrac{\sin(2t) + \ln(t)}{(t^3 + 3t)^5}$

Related rate problem

A cube has volume given by

$$V = x^3$$

Suppose the volume is increasing at a rate of $5 in^3/sec$.

(a) differentiate ~~with~~ wrt t

(b) Find the lenght when $V = 25 in^3$

(c) How fast is the length increasing when $V = 25 in^3$?

(d) How fast is the surface area increasing when $V = 25 in^3$??

Test 3

- 7 MC Questions in 15 minutes No Calculator
- 1 related rates Question in parts 15 minutes

20 minutes non-AP part, implicit differentiation, product, chain rule finding local min/max inflection points of a polynomial and graphing No Calculator.