MA 22000 Lesson 38 Notes
Section 4.3 (2nd half of text) part 2

This is a continuation of finding derivatives of exponential functions.

Example 1: Find each derivative.

$a)\quad f(x) = x^2(e^{2x})$

$b)\quad \dfrac{2e^x}{x^2}$

$c)\quad g(x) = \dfrac{e^x - e^{-x}}{4}$

$d)\quad F(x) = x^3e^x - e^x$

$e)\quad f(x) = 2(e^{2x} + e^{-x})^{-3}$

2) Determine the equation of the tangent line to the function at the given point.

a) $y = xe^{2x}$ $\left(1, e^2\right)$ *b*) $y = (e^x + 2)^3$ $(0,8)$

3) The accumulated value *A* (in dollars) for a savings account if given by $A = 2000e^{0.05t}$, where *t* is in years. Find the rates of change in the accumulated value when (a) *t* = 5 years and (b) *t* = 30 years.

4) The yield *Y* (in pounds per acre) for an orchard of age *t* years is modeled by $Y = 6854.2e^{(-0.054/t)}$. Find the rates of change in the yield when *t* = 5 years. When t = 15 years. When *t* = 30 years.