

Home work on Derivatives of exp and ln

Note Title

3/26/2009

① Please find the derivatives of

a) $f(x) = x^2 - 7x + 9 \ln|x| + 3e^x$

b) $g(x) = \frac{5}{2\sqrt[3]{x^4}} - \frac{\log_2(x)}{3} + \frac{2^x}{5}$

c) $h(x) = 5x^3 + 7 \ln(e^2)$

② Find the indicated derivatives:

a) $y = 3x^2 - 7x + 9$, find y''

b) $y = \sqrt{x} - \frac{1}{x} - \ln(x) - e^x$, find y''

c) $y = 3x^3 + 2x^2 + x + 1$, find $y^{(4)}$ (4-th derivative)

③ Where are the following functions concave up?

a) $y = x^3 + 3x^2 - 5x + 3$

b) $y = x^4 - 24x^2$

④ Suppose a profit function is given by

$$P(x) = 2 \ln(x) - x^2 + 5 \quad \text{for } x > 0$$

where x is the number of units produced in thousands. How many units should be produced to obtain max. profit, and what is the max. profit?