Suggested Homework for Lecture 5
Math 116

(1) Differentiate the following functions.

    (1a) $(x^2 + x)e^x$

    (1b) $\frac{x^2}{e^x + x}$

    (1c) e^{5x+13}

    (1d) $\frac{x^3 + e^x}{x+1}$

    (1e) $(x^5 + x^2)\ln(x)$

    (1f) $\ln(x^3 + x^2)$

    (1g) e^{e^x}

    (1h) $\frac{x^2 + x}{e^x}$

    (1i) $e^x(e^x + 10)$

    (1j) $\ln(2x + 10)$

(2) Differentiate the following functions.

    (2a) $x^2(x^3 + 1)e^x$

    (2b) $e^{x\ln(x)}$

    (2c) $\frac{xe^x}{x^2 + 1}$

    (2d) $((x^2 + 1)e^x)^5$

    (2e) $\frac{\ln(x+3)}{x^2}$

    (2f) $((x^3 + 10x)^2 + x^2 + 4)^2$

    (2g) $e^{\left(\frac{x}{x+1}\right)}$

Answers to Suggested Homework for Lecture 5
Math 116

(1a) $(x^2 + 3x + 1)e^x$

(1b) $\frac{-x^2 e^x + 2xe^x + x^2}{(e^x + x)^2}$

(1c) $5e^{5x+13}$

(1d) $\frac{2x^3 + 3x^2 + xe^x}{(x+1)^2}$

(1e) $x^4 + x + 5x^4 \ln(x) + 2x \ln(x)$

(1f) $\frac{3x+2}{x^2+x}$

(1g) $e^{e^x} e^x$

(1h) $\frac{-x^2 + x + 1}{e^x}$

(1i) $e^x(2e^x + 10)$

(1j) $\frac{1}{x+5}$

(2a) $(x^5 + 5x^4 + x^2 + 2x)e^x$

(2b) $e^{x \ln(x)}(1 + \ln(x))$

(2c) $\frac{x^3 e^x - x^2 e^x + xe^x + e^x}{(x^2+1)^2}$

(2d) $5((x^2 + 1)e^x)^4 (x^2 + 2x + 1)e^x$

(2e) $\frac{\frac{x}{x+3} - 2\ln(x+3)}{x^3} = \frac{x - 2(x+3)\ln(x+3)}{x^3(x+3)}$

(2f) $2((x^3 + 10x)^2 + x^2 + 4)(2(x^3 + 10x)(3x^2 + 10) + 2x)$

(2g) $\frac{e^{\left(\frac{x}{x+1}\right)}}{(x+1)^2}$