Assignment 1

Due 6/27/2014

Problem 1 – Derivatives

Find the derivative with respet to x of the following functions. The symbol α represents a constant.

(a) $f(x) = \sqrt{x^2 + \alpha^2}$

(b) $g(x) = \arctan(x^5)$

(c) $y(x) = x \cdot \alpha^x$

(d) $h(x) = e^{\sin(2x)}$

(e) $y(x) = \frac{\alpha}{x^2+\alpha^2}$

(f) $f(x) = (\tan x)^{\cos(2x)}$

Problem 2 – Integrals

Evaluate the following integrals. Once again, α is a constant. (Don't forget any other constants!)

(a) $\int x \cdot (x^2 - \alpha^2)^{-1/2} \, \mathrm{d}x$

(b) $\int \alpha \sin(x) \cos(x) \, \mathrm{d}x$

(c) $\int x^{-1} \, \mathrm{d}x$

(d) $\int \frac{x-16}{2x^2-9x-5} \, \mathrm{d}x$

(e) $\int \ln(x) \, \mathrm{d}x$

(f) $\int (x^2 + \alpha^2)^{-3/2} \, \mathrm{d}x$