EE206 Assignment 3 *

Due 15th Oct.

Read Programmes 14-17 (Page 731-820) and answer the following questions

1. If $z = \tan(x^2 - y^2)$, find $\dfrac{\partial z}{\partial x}$ and $\dfrac{\partial z}{\partial y}$
2. If $z = \dfrac{1}{x^2 + y^2 - 1}$, show that $x\frac{\partial z}{\partial x} + y\frac{\partial z}{\partial y} = -2z(1 + z)$
3. If $z = e^x(x\cos y - y\sin y)$, show that $\dfrac{\partial^2 z}{\partial x^2} + \dfrac{\partial^2 z}{\partial y^2} = 0$
4. Determine the following
   (a) $\int x^2 \ln x dx$ (Hint: integration by parts)
   (b) $\int \frac{x+1}{x^2-3x+2} dx$ (Hint: integration by partial fractions)
   (c) $\int \cos^4 x dx$ (Hint: Integration of trigonometric functions)
   (d) $\int \frac{dZ}{Z^2+A^2}$
   (e) $\int \frac{dZ}{\sqrt{Z^2+A^2}}$

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