

Question Four

(a) Find $\frac{dy}{dx}$ for each of the following:-

i) $y = (2x - 3)^{10}$

ii) $y = e^{x^2+1}$

iii) $y = x^3 e^{2x}$

iv) $y = \frac{1-x}{x^2+4}$

v) $y = \frac{3}{2} \ln(x^2 - 2)$

simplifying your answers as far as possible.

(13 marks)

(b) Express

$$\frac{3x - 5}{(1 - x)(1 - 2x)}$$

in partial fractions. Hence differentiate it.

(7 marks)

a) If $z = 2x^n + 4y^n - 6x^n y^n$

where n is constant find the two first order partial derivatives.

(5 marks)