



QUESTION FOUR

(a) If $z = x^3 + y^3 - 3xy$

Find $\left(\frac{\partial^2 z}{\partial x^2}\right)\left(\frac{\partial^2 z}{\partial y^2}\right) - \left(\frac{\partial^2 z}{\partial x \partial y}\right)^2$

(8 marks)

(b) Solve the equation:

$$\frac{2}{3x} - \frac{3x}{4} = 5$$

Give both answers correct to 2 decimal places.

(8 marks)

(c) Expand fully $(3 - 4x + 2x^2)(1 + 3x - 4x^2)$

Hence state the coefficient of x^2 .

(3 marks)

(d) Sketch (on separate diagrams) the following straight lines, indicating the general shape of the lines and the co-ordinates where the lines cross the x and y axes.

(i) $y = -2x + 5$

(ii) $y = 4$

(iii) $y = -x$

(iv) $x = -2$

(6 marks)