

Question 2

$$a) y = x^2 + 3x \quad (1, 4) \quad - \quad x^2 + 3x - y = 0$$

$$\frac{-b}{2a}$$

$$y - y_1 = m(x - x_1)$$

$$y - 4 = m(x - 1)$$

$$= \frac{-3}{1}$$

$$y - 4 = -3(x - 1)$$

$$\therefore m = -3$$

$$y - 4 = -3x + 3$$

$$y = -3x + 7$$

b)

$$i) AB = m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$A(-2, 5)$$

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

$$B(4, 3)$$

$$= \frac{-2}{6}$$

$$= -\frac{1}{3}$$

~~$$\frac{1}{3}x - 4\frac{1}{3} + y = 0$$~~

$$y = -\frac{1}{3}x + 4\frac{1}{3}$$

$$-13 + 3y = -x + 4$$

$$x + 3y - 13 = 0$$

$$y - y_1 = m(x - x_1)$$

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

$$y - 5 = -\frac{1}{3}x + \frac{2}{3}$$

$$y = -\frac{1}{3}x + 4\frac{1}{3}$$

$$ii) d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

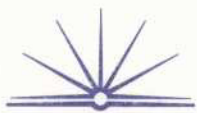
$$= \sqrt{(4 + 2)^2 + (3 - 5)^2}$$

$$= \sqrt{36 + 4}$$

$$= \sqrt{40}$$

~~$$= 6.3$$~~

$$= \sqrt{40} = 2\sqrt{10}$$



iii) $O(0,0)$

$C(0,4)$

$$3x + 3y - 13 = 0$$

$$0 + 3 \cdot 4 - 13 = 0$$

$C(0,4)$

$$12 - 13 = 0$$

$C(0, \frac{13}{3})$

$$-1 = 0$$

\therefore Perpendicular distance

$$4 - \frac{13}{3}$$

$$= \frac{3}{10} \text{ units}$$

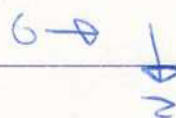
$$4 - \frac{13}{3}$$

iv) $2\sqrt{10} \times \frac{3}{10}$

$$= 20.87 \text{ units}^2$$

v) $O(0,0)$

$A(-2,5)$



$B(4,3)$

$C(6,-2)$