Question 2

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

$x^2 + 3x - y = 0$

$-\frac{b}{a}$

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

$\therefore m = -3$

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

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

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

$y - 4 = -3x + 1$

$y = -3x + 5$

b)

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

$A(-2, 5)$ $x_1\ y_1$

$B(4, 3)$ $x_2\ y_2$

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

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

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

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

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

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

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

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

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

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

$x + 3y - 13 = 0$

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) $O(0,0)$ $C(0,4)$

$x+3y-13=0$

$0+3\cdot4-13=0$

$12-13=0$

$-1=0$

$C(0,4$

$C(0,3\frac{3}{10})$

$\therefore$ Perpendicular distance $= 3\frac{3}{10}$ units

4.325

4.33

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

$= 20.87 \text{ units}^2$

v) $O(0,0)$ $A(-2,5)$ $B(4,3)$

$C(6,-2)$