BOARD OF STUDIES
NEW SOUTH WALES

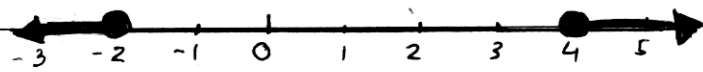
Q4. c) $|x-1| \geq 3$

$x - 1 \geq 3$ or $-(x-1) \geq 3$

$x \geq 4$ $\quad -x + 1 \geq 3$

$-x \geq 2$

$x \leq -2$

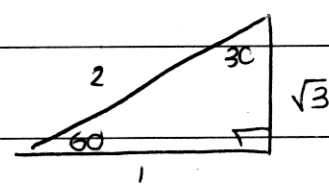


b) $0^\circ \leq \theta \leq 360^\circ$

$\cos\theta - \frac{2}{5} = 0$ $\quad : 0^\circ \leq 5\theta \leq 1800$

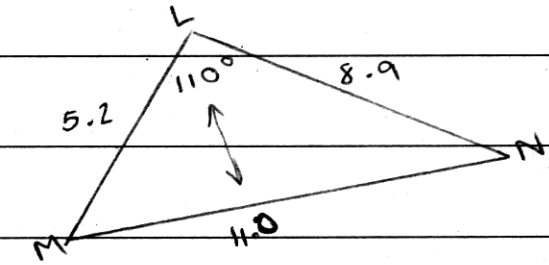
~~$\cos\theta = \frac{2}{5}$~~

$\cos\theta = 2.$



BOARD OF STUDIES
NEW SOUTH WALES

c)



~~$c^2 = b$~~

i) ~~cos~~ $a^2 = b^2 + c^2 - 2bc\cos A$

$l^2 = 5.2^2 + 8.9^2 - 2 \times 5.2 \times 8.9 \times \cos 110°$

$l^2 =$ ~~120.7295~~ 120.7295741 (by calculator)

$l = \sqrt{120.7295741}$

$= 10.98770104$ (by calculator)

$MN =$ ~~10~~ 11.0 (1 dp)

ii) ~~A~~ $= \frac{1}{2}ab\sin C$

$= \frac{1}{2} \times 5.2 \times 8.9 \times \sin 110$

$= 22.8551088$ (by calculator)

$= 22.9\ m^2$ (1 dp).

BOARD OF STUDIES
NEW SOUTH WALES

d) i) $y = 6x - x^2$ $\quad x(6-x) = y$

$y = 2x$ $\quad 2x = y$

$2x = 6x - x^2$ $\quad 2x = x(6-x)$

$x^2 = 4x$ $\quad 2 = 6 - x$

$x^2 - 4x = 0$ $\quad x = 4.$

when $x = 4$ $\quad$ when $x = 4$

$4^2 - 4(4)$ $\quad 2(4) = 4(6-4)$

$8 = 8.$

$\therefore B = (4, 8)$

ii) $y = 6x - x^2$ cuts x axis when $y = 0$

$6x - x^2 = 0$

$x(6-x) = 0$

$x = 0$ and $x = 6$

$$\text{Area} = \int_0^6 6x - x^2 \, dx - \int_0^6 2x \, dx$$

$$= \left[3x^2 - \frac{x^3}{3}\right]_0^6 - \left[x^2\right]_0^4$$

$$= \left[\left(3(6)^2 - \frac{6^3}{3}\right)\right] - \left[4^2\right]$$

$$= [108 - 72] - 16 = 20 \text{ units}^2$$