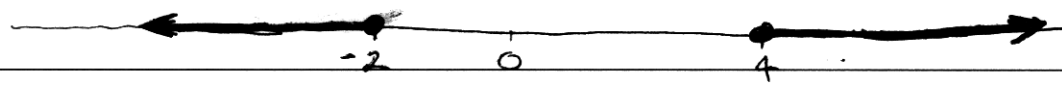
BOARD OF STUDIES
NEW SOUTH WALES

a.) $|x-1| \geq 3$

$x-1 \geq 3$ $\quad$ $x-3 \leq -3$

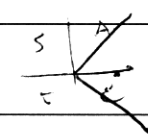
$x \geq 4$ $\quad$ $x \leq -2$

$x \geq 4$ $\quad$ $x \leq -2$



b.) $0° \leq \theta \leq 360°$

$\cos\theta - \frac{2}{5} = 0$



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

$\theta = 66°$ and $\theta = 112°$

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

c.) i.) $a^2 = 5.2^2 + 8.9^2 - 2 \times 5.2 \times 8.9 \cos 110°$

$a^2 = 27.04 + 79.21 - 92.56\cos 110°$

$= 106.25 + 31.65738447$

$a^2 = 137.9073845$

$a = 11.74339749$

$= 11.74$ (to 2 d.p) or 11m 74cm

$\tan\theta = \frac{8.9}{5.2}$

$\theta = 59°42'$

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

$= \frac{1}{2} 11.74339749 \times 5.2 \sin 59°42'$

$A = 26.36 \text{ cm}^2$

BOARD OF STUDIES
NEW SOUTH WALES

d.) ii) $y = 2x$ ....①

$y = 6x - x^2$ ....②

from ①

$\frac{y}{2} = x$

sub into ②

$y = 6\left(\frac{y}{2}\right) - \left(\frac{y}{2}\right)^2$

$y = \frac{6y}{2} - \frac{y^2}{4}$

$y = 3y - \frac{y^2}{4}$

$4y = 12y - y^2$

$0 = 8y - y^2$

$8y - y^2 = 0$

$y^2 - 8y = 0$

$y(y-8) = 0$

$y = 8$

sub into ①

$8 = 2x$

$x = 4$

so points are $(4, 8)$

BOARD OF STUDIES
NEW SOUTH WALES

ii) $y = 6x - x^2$ $\quad y = 2x$

$$A = \int_0^4 (6x - x^2) - (2x)\, dx$$

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

$$= \left[\left(3(4)^2 - \frac{(4)^3}{3} \right) - \left((4)^2 \right) - \left(\left(3(0)^2 - \frac{0^3}{3}\right) - (0^2) \right) \right]$$

$$= 48 - 21\tfrac{1}{3} - 16$$

$$A = 10\tfrac{2}{3} \ u^2$$