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NEW SOUTH WALES

Question (4)

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

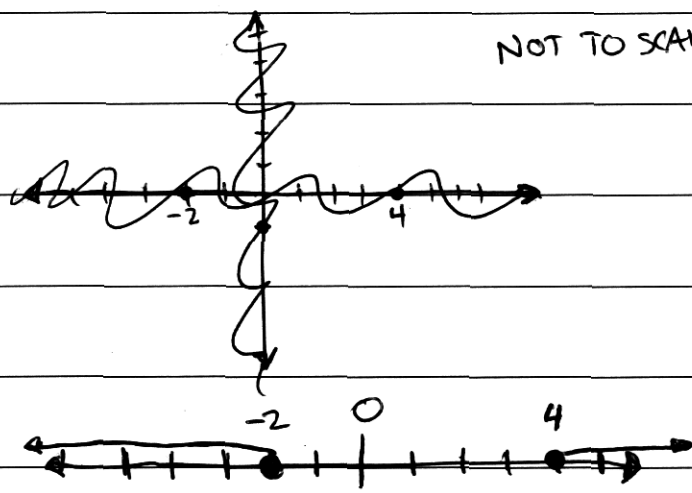
$(x-1)^2 \geq 9$

$x^2 - 2x + 1 \geq 9$

$x^2 - 2x - 8 \geq 0$

$(x-4)(x+2) \geq 0$

$\therefore$ ~~Sketch~~ roots are 4 and -2



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

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

$\therefore \theta = 66°25'18...$

$= 66°$ or $294°$

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NEW SOUTH WALES

c) i) NOT ATTEMPTED

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

$\therefore A = \frac{1}{2} \times 5.2 \times 8.9 \times \sin 110^\circ$

$A = 21.744$ (3dp)

d) i) $y = 6x - x^2$ (1)

$y = 2x$ (2)

sub (2) → (1)

$2x = 6x - x^2$

$\therefore 4x - x^2 = 0$

$\therefore x(4 - x) = 0$

$\therefore x = 0$ OR 4

sub $x = 4$ into (2)

$y = 2(4)$

$= 8$

$\therefore$ point of int. $(4, 8)$ exists.

ii) PTO

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ii)

$$\int_0^4 6x - x^2\,dx \qquad \int_0^4 2x\,dx$$

$$\therefore \left[3x^2 - \tfrac{1}{3}x^3\right]_0^4 \qquad \therefore \left[x^2\right]_0^4$$

$$\therefore \left[48 - 21\tfrac{1}{3}\right] \qquad \therefore \left[16\right]$$

$$\therefore \tfrac{144}{3} - \tfrac{64}{3}$$

$$= \tfrac{80}{3}$$

$$\therefore \tfrac{80}{3} - 16 = 10\tfrac{2}{3}\ \text{unit}^2$$

bound by two eq.