Start here for Question Number: 7

a) i) $\ddot{x} = 4\cos 2t$

$\dot{x} = 2\sin 2t + C$

$0 = \cos\theta + C$

$\therefore C = 1$

$\dot{x} = 2\sin 2t + 1$

$0 = 2\sin 2t$

$\frac{1}{a}\sin ax$

ii) $2\sin 2t + 1 = 0$

$\frac{2\sin 2t}{2} = \frac{-1}{2}$

$\sin t = -\frac{1}{2}$

$t = 30$ seconds.

iii) $\dot{x} = 2\sin 2t + 1$

$\therefore x = -\cos 2t$

b) i) $y = x^2$ $(-1, 1)$

$y' = 2x$

$2x - 1$

$m = -2$

$y - 1 = -2(x + 1)$

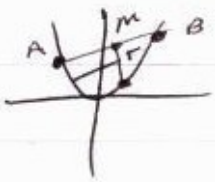
$y - 1 = -2x - 2$

$+1 \qquad +1$

$y = -2x - 1$

$\therefore 2x + y + 1 = 0$

ii) $(-1, 1)\ (2, 4)$



$\frac{2-1}{2}, \frac{5}{2}$

$M = (\frac{1}{2}, 2\frac{1}{2})$ Midpoint

$\frac{4-1}{2+1} = \frac{-3}{3}$

$AB\ m = -1$

$-1 \times m_2 = -1$

$\frac{-1}{-1} \quad \frac{-1}{-1}$

$m_2 = 1$

$y - 1 = 1(x+1)$

$y = x + 0$

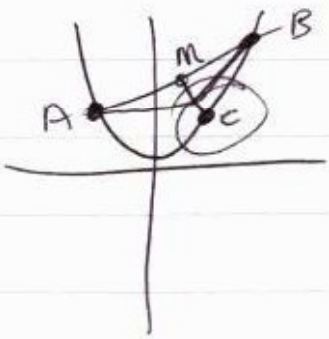
$2x + y + 1 = 0$

$(\frac{1}{2}, 2\frac{1}{2})$

$$\frac{|2 \times \frac{1}{2}| + |1 \times 2\frac{1}{2} + 1|}{\sqrt{2^2 + 1^2}} = \frac{4\frac{1}{2}}{\sqrt{5}}$$

$\therefore$ Vertical

iii)



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