

Start here for
Question Number: 7 a.

i. Velocity of particle = $\dot{x} = 2\sin 2t + 1$
 $= 2\cos 2t$.
 velocity requires
 differentiation.

ii. Rest ~~= 0~~ when acceleration = 0.

$$\dot{x} = 4\cos 2t$$

$$\text{m s}^{-1}.$$

iii displacement x time of t .

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

$$x = \cos t^2 + 1 + C.$$

b.

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

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{4 + 1}{2 - 1}$$

$$= \frac{5}{1} = 5.$$

$$y - 1 = 5(x + 1)$$

$$y - 1 = 5x + 5.$$

$$5x - y + 6 = 0.$$



ii. M of AB. $\left(\frac{x_2 + x_1}{2}\right), \left(\frac{y_2 + y_1}{2}\right)$.

$$\left(\frac{2 - 1}{2}\right), \left(\frac{4 + 1}{2}\right)$$

$$\left(\frac{1}{2}, \frac{5}{2}\right)$$

C. parallel $m_1 = m_2$.
Equation of line are equal.

Gradient of $m =$ gradient of AB
gradient of $m = 5$.
Line MC gradient $= 5$.

$$M \left(\frac{1}{2}, \frac{5}{2} \right)$$

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

$$\left[y - \frac{5}{2} = 5x - \frac{5}{2} \right] \quad \times 2$$

$$2y - 5 = 10x - 5x.$$

~~$10x - 2y$~~

$$5x - 2y - 5 = 0$$

iii. tangent line. $y - y_1 = m(x - x_1)$.
H.