

Eg (i) (ii)

Kinematics

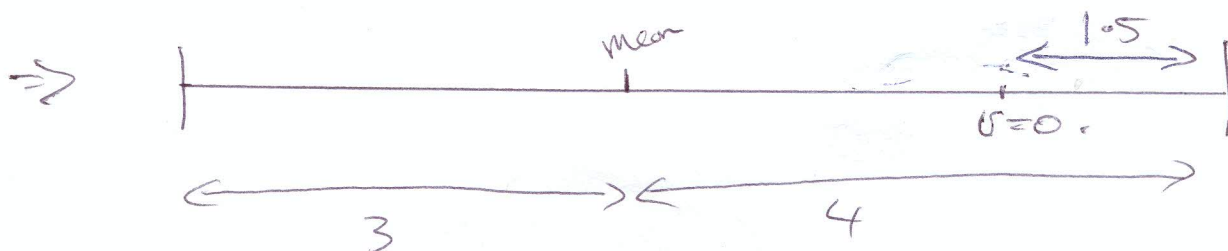
$$\left[\begin{array}{l} a = -\omega^2 x \\ v^2 = \omega^2 (A^2 - x^2) \\ x = A \sin \omega t. \\ (x = A \cos \omega t) \\ T = \frac{2\pi}{\omega} \end{array} \right]$$

To proceed to find time required need to use

either $x = A \sin \omega t$

so need to find A.

Told particle released from rest 2.5m from the right wall.



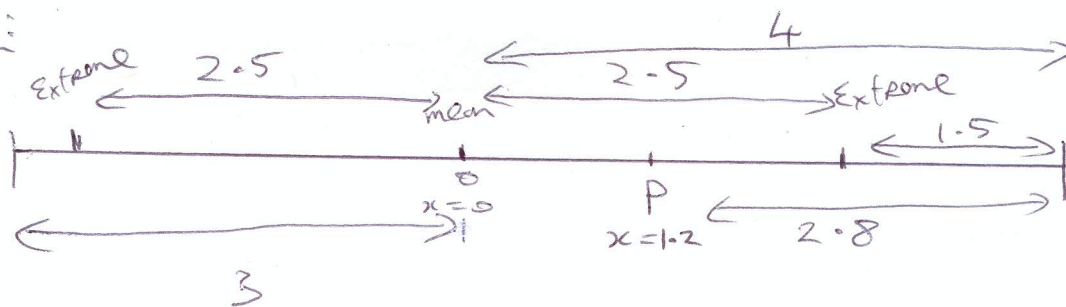
$$\therefore v=0 \text{ at } x = 4 - 1.5$$

$$x = 2.5$$

$\therefore$

$$\boxed{A = 2.5}$$

Required time:



Required time $t_{po} = t_{op}$

At point P $x = 4 - 2.8$
 $x = 1.2$

$$x = A \sin \omega t.$$

$$\Rightarrow 1.2 = 2.5 \sin 2t.$$

$$\Rightarrow \frac{1.2}{2.5} = \sin 2t$$

$$\Rightarrow 0.48 = \sin 2t.$$

$\sin^{-1}$

$$\Rightarrow 0.5 = 2t$$

$$\Rightarrow \boxed{0.25 = t \text{ sec.}}$$