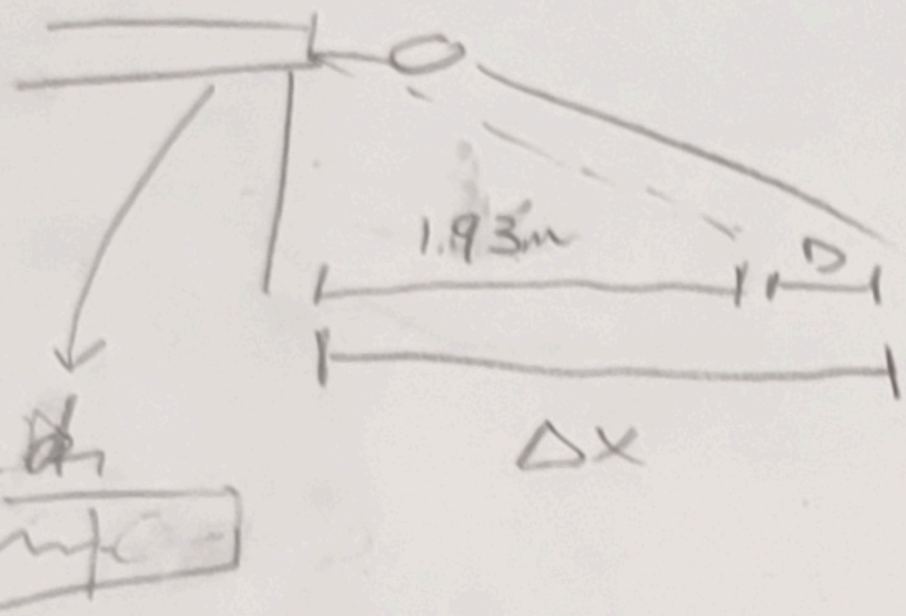
Q9)



$\Delta x = 2.2m$

$D = 0.27\ m$

$d = 0.011$

We know

Δx D

g

$$mgh + \frac{1}{2}kx^2 = \frac{1}{2}mv_1^2$$

$$\frac{1}{2}mv_1^2 - mgh$$

$$\frac{1}{2}d^2$$

$$k = \frac{mv_1^2 - 2mgh}{(d)^2}$$

$$\Delta x = v_0 t + \frac{1}{2}at^2$$

$$v = v_0 + at$$

$$v^2 = v_0^2 + 2a\Delta x$$

$$\Delta x = \frac{(v + v_0)t}{2}$$

$$v_{1x} = \frac{(\Delta x - D)}{t}$$

$$v_{2x} = \frac{\Delta x}{t}$$

$$mgh + \frac{1}{2}\left(\frac{m\frac{(\Delta x - D)^2}{t^2} - 2mgh}{d^2}\right)x^2 = \frac{1}{2}m\frac{\Delta x^2}{t^2}$$

$$mgh + \left(\frac{m(1.93)^2}{2t^2d^2} - \frac{mgh}{d^2}\right)x^2 = \frac{1}{2}m\frac{\Delta x^2}{t^2}$$