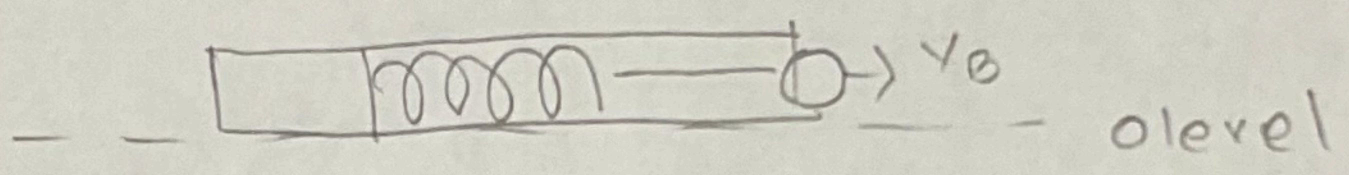
Distance traveled by Bobby's ball = 2.2m - 0.27m

= 1.93 m

∴ for Bobby's Ball, use conservation of energy,

$(PE)_i = \frac{1}{2} k(\Delta x_B)^2$ | $(KE)_i = 0$

$(PE)_f = 0$ | $(KE_f) = \frac{1}{2} m v_B^2$



∴ $\Delta PE + \Delta KE = 0$

$(PE_f - PE_i) + (KE_f + KE_i) = 0$

$(-\frac{1}{2} k(\Delta x)^2) + (\frac{1}{2} m v_B^2) = 0$

$\cancel{\frac{1}{2}} m v_B^2 = \cancel{\frac{1}{2}} k(\Delta x_B)^2$

$$\boxed{v_B = \Delta x_B \sqrt{\frac{k}{m}}}$$

∴ $v_B = (0.011)\sqrt{\frac{k}{m}}$

let For Rhoda's ball, compression be Δx_R

∴ $\frac{1}{2} k(\Delta x_R)^2 = \frac{1}{2} m v_R^2$

$$\boxed{v_R = (\Delta x_R)\sqrt{\frac{k}{m}}}$$

$v_B(t) = 1.93$ — ①

$v_R(t) = 2.2$ — ②

① % ② : $\frac{v_B}{v_R} = \frac{1.93}{2.2}$ (Both balls take same time)

$$\therefore \frac{(0.011)\sqrt{\frac{k}{m}}}{(\Delta x)\sqrt{\frac{k}{m}}} = \frac{1.93}{2.2}$$

$$\therefore \Delta x = \frac{(2.2)(0.011)}{1.93}$$

$$\Delta x = 0.0125\,m$$

$$\therefore \boxed{\Delta x = 1.25\,cm}$$