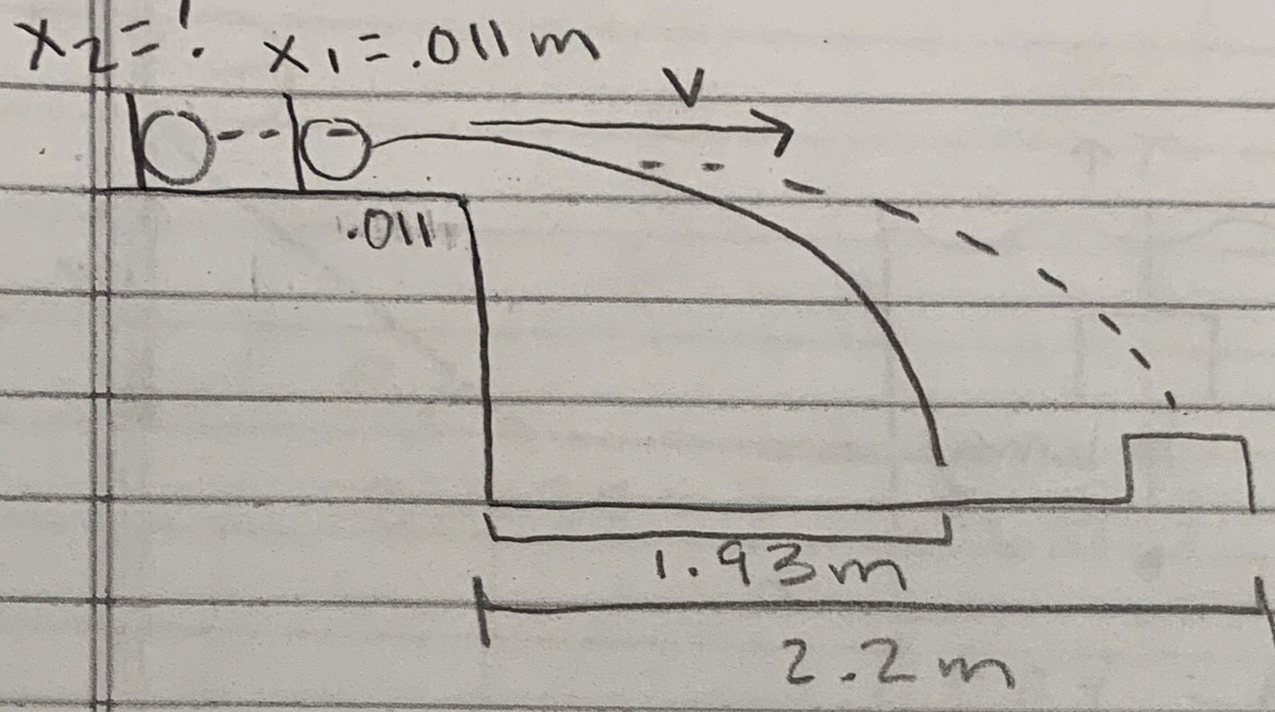
Q: 9






$\frac{1}{2}kx_1^2 = \frac{1}{2}mv_1^2 \rightarrow k$

$\frac{1}{2}kx_2^2 = \frac{1}{2}mv_2^2$

$d_1 = v_1 \cdot t \quad \hookrightarrow \quad kx_1^2 = mv_1^2 \rightarrow \sqrt{\frac{kx_1^2}{m}} = v_1$

$d_2 = v_2 \cdot t \quad kx_2^2 = mv_2^2 \rightarrow \sqrt{\frac{kx_2^2}{m}} = v_2$

$\frac{d_1}{d_2} = \frac{v_1 \cancel{t}}{v_2 \cancel{t}} \qquad \frac{d_1}{d_2} = \frac{v_1}{v_2}$

$$\frac{d_1}{d_2} = \frac{\sqrt{\frac{kx_1^2}{m}}}{\sqrt{\frac{kx_2^2}{m}}}$$

$$\frac{d_1}{d_2} = \frac{\sqrt{kx_1^2}}{\sqrt{kx_2^2}}$$

$$\frac{d_1}{d_2} = \frac{\sqrt{k} \cdot x_1}{\sqrt{k} \cdot x_2}$$

$$\frac{d_1}{d_2} = \frac{x_1}{x_2}$$

$d_1 x_2 = d_2 x_1$

$x_2 = \frac{d_1 x_1}{d_2} = \boxed{.0125\,m}$

$d_1\sqrt{x_2} = d_2\sqrt{x_1}$

$\sqrt{x_2} = \frac{d_2\sqrt{x_1}}{d_1}$

$x_2 = \left(\frac{d_2\sqrt{x_1}}{d_1}\right)^2$

$x_2 = \left(\frac{2.2\sqrt{.011}}{1.93}\right)^2$

$x_2 = \boxed{.014\,m}$