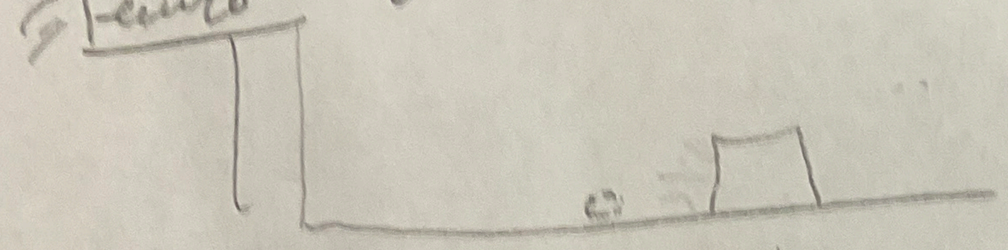
$\Delta x_B = 0.011m$

$k_B = 2.2m - 0.27m$

$\Delta x_R = ?$



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

$$v_B = \sqrt{\frac{\Delta x_B^2 k}{m}}$$

$$1.93 = \sqrt{\frac{\Delta x_B^2 k}{m}}\, t$$

$$1.93^2 = \frac{\Delta x_B^2 k}{m} t^2$$

$$\frac{2.2^2}{1.93^2} = \frac{\Delta x_R^2}{\Delta x_B^2}$$

$$\Delta x_R = \sqrt{\frac{2.2^2}{1.93^2} \cdot \Delta x_B^2}$$

$$\boxed{\Delta x_R = 0.01253m}$$

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

$$2.2 = \sqrt{\frac{\Delta x_R^2 k}{m}}\, t$$

$$2.2^2 = \frac{\Delta x_R^2 k}{m} t^2$$

$\frac{1}{2}mv^2 = \frac{1}{2}(m+M)v^2$

$mv_i^2 = (m+M)v_f^2$

$v_f = \sqrt{\frac{mv_i^2}{m+M}}$

$mv_i = 3mv_2$

$v_1 = 3v_2$

$\frac{1}{2}mv_1^2 = \frac{1}{2}3m\,9v_2^2$

$10.7840 = Lm$

$F = PA$

$v_f^2 = v_i^2 + 2a\Delta x$

$v_f = v_i + at$

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