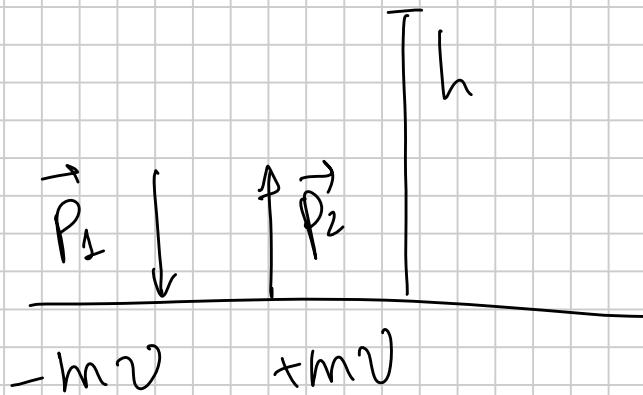


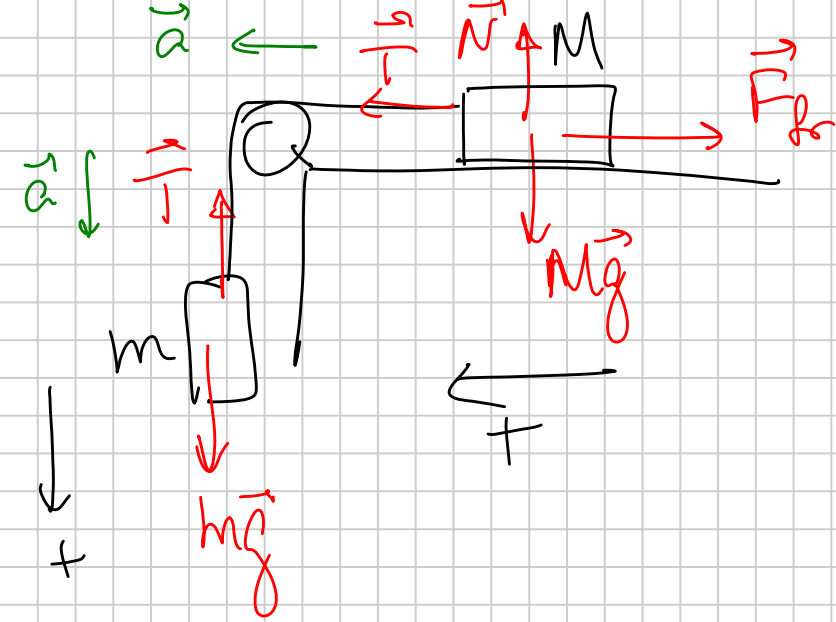
$$mgh = mgH$$
$$h = H$$



$$F = \frac{\Delta p}{\Delta t} = \frac{2mv}{\Delta t}$$

$$\frac{1}{2}mv^2 = mgh \Rightarrow v = \sqrt{2gh} =$$
$$= \sqrt{2 \cdot 10 \cdot 3.2} = 8 \text{ m/s}$$

$$F = \frac{2 \cdot 0.5 \cdot 8}{0.02} = \underline{\underline{400 \text{ N}}}$$



$$\begin{cases} mg - T = ma \\ T - F_{fr} = Ma \end{cases}$$

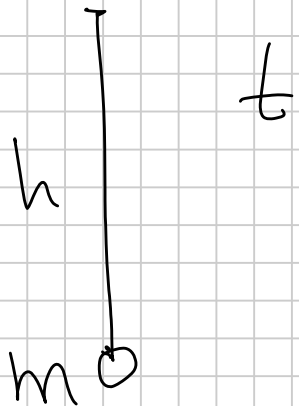
$$F_{fr} = \mu N = \mu Mg$$

$$T = Ma + \mu Mg$$

$$mg - Ma - \mu Mg = ma$$

$$mg - \mu Mg = a(m + M)$$

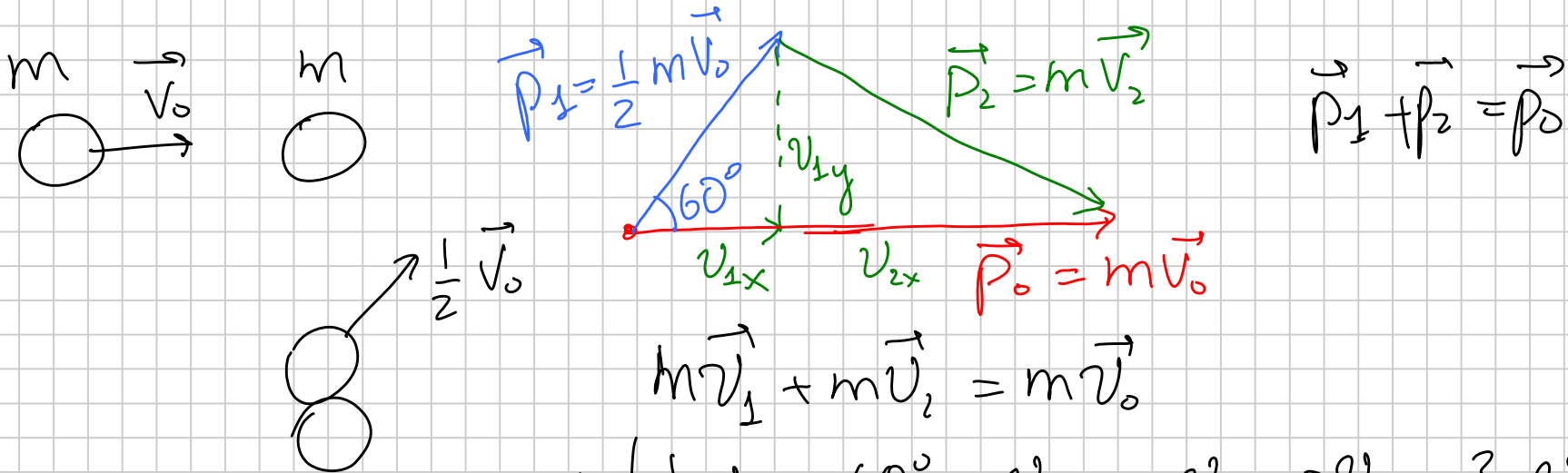
$$a = \frac{mg - \mu Mg}{m + M}$$



$$P = \frac{W}{t} = \frac{mgh}{t} = \frac{100 \cdot 10 \cdot 30}{60} = 500 \text{ W}$$

$$PE = \frac{1}{2} kx^2 = W = \mu mgd$$

$$x = \sqrt{\frac{2\mu gdm}{k}} = \sqrt{\frac{2 \cdot 0.1 \cdot 10 \cdot 10 \cdot 0.5}{1000}} = \sqrt{0.01} = 0.1 \text{ m}$$



$$m\vec{v}_1 + m\vec{v}_2 = m\vec{v}_0$$

$$x: \left\{ \frac{1}{2} v_0 \cos 60^\circ + v_{2x} = v_0 \Rightarrow v_{2x} = \frac{3}{4} v_0 \right.$$

$$y: \left\{ \frac{1}{2} v_0 \sin 60^\circ + v_{2y} = 0 \quad v_{2y} = -\frac{v_0}{2} \sin 60^\circ = \right.$$

$$v_{2y} = -\frac{v_0 \sqrt{3}}{4}$$

$$v_2 = \sqrt{v_{2x}^2 + v_{2y}^2} =$$

$$= \sqrt{v_0^2 \left(\frac{3}{4}\right)^2 + v_0^2 \frac{3}{4^2}} = v_0 \sqrt{\frac{12}{16}} = v_0 \frac{\sqrt{3}}{2}$$

$$v_2 = v_0 \sin 60^\circ = v_0 \frac{\sqrt{3}}{2} = 0.866 v_0$$

$$\frac{1}{2}m v_1^2 + \frac{1}{2}m v_2^2 = \frac{1}{2}m \frac{v_0^2}{4} + \frac{1}{2}m \frac{v_0^2 \cdot 3}{4} = \frac{1}{2}m v_0^2 \left( \frac{1}{4} + \frac{3}{4} \right) = \underline{\underline{\frac{1}{2}m v_0^2}}$$