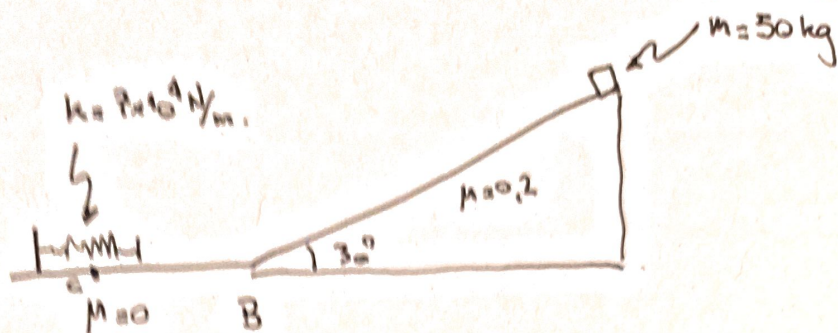


$$P = 500 \text{ N}$$

$$L = 20 \text{ m}$$

$$\alpha = 30^\circ$$

$$\mu = 0,2$$



(a) Velocitat quan arriba al final de la rampa:

$$\Delta E_c = W_{F_f}$$

$$\frac{1}{2} m v^2 = F_f \cdot \Delta x \cdot \cos \alpha = \mu m g \sin \alpha \cdot \Delta x \cdot \cos \alpha$$

$$v = \sqrt{2 \mu g \Delta x \sin \alpha \cdot \cos \alpha}$$

$$= \sqrt{2 \cdot 0,2 \cdot 10 \cdot 20 \cdot \sin 30^\circ \cdot \cos 30^\circ} = \boxed{5,89 \text{ m/s}}$$

$$\Delta x = \frac{1}{2} a t^2 \Rightarrow t = \sqrt{\frac{2 \Delta x}{a}}$$

$$\text{però } a = g \sin \alpha \Rightarrow t = \sqrt{\frac{2 \Delta x}{g \sin \alpha}} = \sqrt{\frac{2 \cdot 20}{10 \sin 30^\circ}} = \boxed{2,83 \text{ s}}$$

A la part plana l'energia mecànica es conserva

$$E_{mB} = E_{mC}$$

$$\frac{1}{2} m v_B^2 = \frac{1}{2} k \Delta x_c^2 \Rightarrow \Delta x_c = \sqrt{\frac{m}{k}} \cdot v_B = \sqrt{\frac{50}{7 \times 10^4}} \cdot 5,89$$

$$\Delta x_c = 0,16 \text{ m} = \boxed{16 \text{ cm}}$$