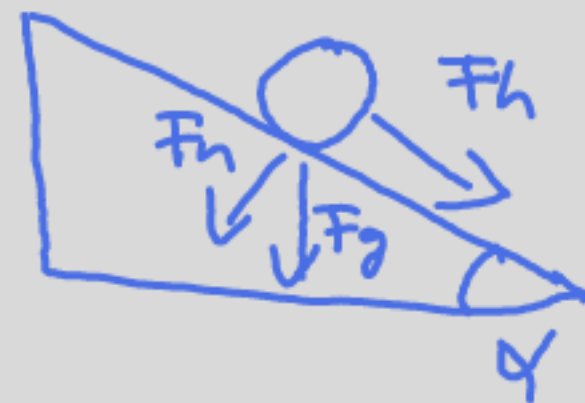




geg.:  $m_z = 5 \text{ kg}$   
 $\alpha = 30^\circ$



$$\begin{aligned} F_g &= m \cdot g \\ &= 5 \text{ kg} \cdot 9,81 \frac{\text{m}}{\text{s}^2} \\ &= 49,04 \text{ N} \end{aligned}$$

$$m \cdot a = m \cdot g \cdot \sin(\alpha) \quad | : m$$

$$a = g \cdot \sin(\alpha)$$

$$a = 4,905 \frac{\text{m}}{\text{s}^2}$$

$$v(t) = a \cdot t + v_0 \quad v_0 = 0$$

$$\begin{aligned} v(4) &= 4,905 \frac{\text{m}}{\text{s}^2} \cdot 4 \text{ s} \\ &= 19,62 \frac{\text{m}}{\text{s}} \end{aligned}$$

$$\text{geg.: } L = 1\text{m}$$

$$\gamma = 20^\circ$$



$$T = 2\pi \cdot \sqrt{\frac{L}{g}}$$

$$= 2\pi \cdot \sqrt{\frac{1\text{m}}{9,81 \frac{\text{m}}{\text{s}^2}}}$$

$$= 2,01\text{s}$$

$$\text{geg.: } m_1 = 0,2 \text{ kg}$$

$$m_2 = 0,1 \text{ kg}$$

$$v_1 = 2 \frac{\text{m}}{\text{s}}$$

$$v_2 = 0 \frac{\text{m}}{\text{s}}$$

$$u_1 = \frac{(m_1 - m_2) \cdot v_1 + 2 \cdot m_2 \cdot v_2}{m_1 + m_2}$$

$$= 0,6 \frac{\text{m}}{\text{s}}$$

$$u_2 = 2,6 \frac{\text{m}}{\text{s}}$$

geg.:  $h = 0,5\text{m}$

$$E_{1\text{pot}} + E_{1\text{kin}}^{\Rightarrow 0} = E_{2\text{pot}}^{\Rightarrow 0} + E_{2\text{kin}}$$

$$E_{1\text{pot}} = E_{2\text{kin}}$$

$$m \cdot g \cdot h = \frac{1}{2} m v^2$$

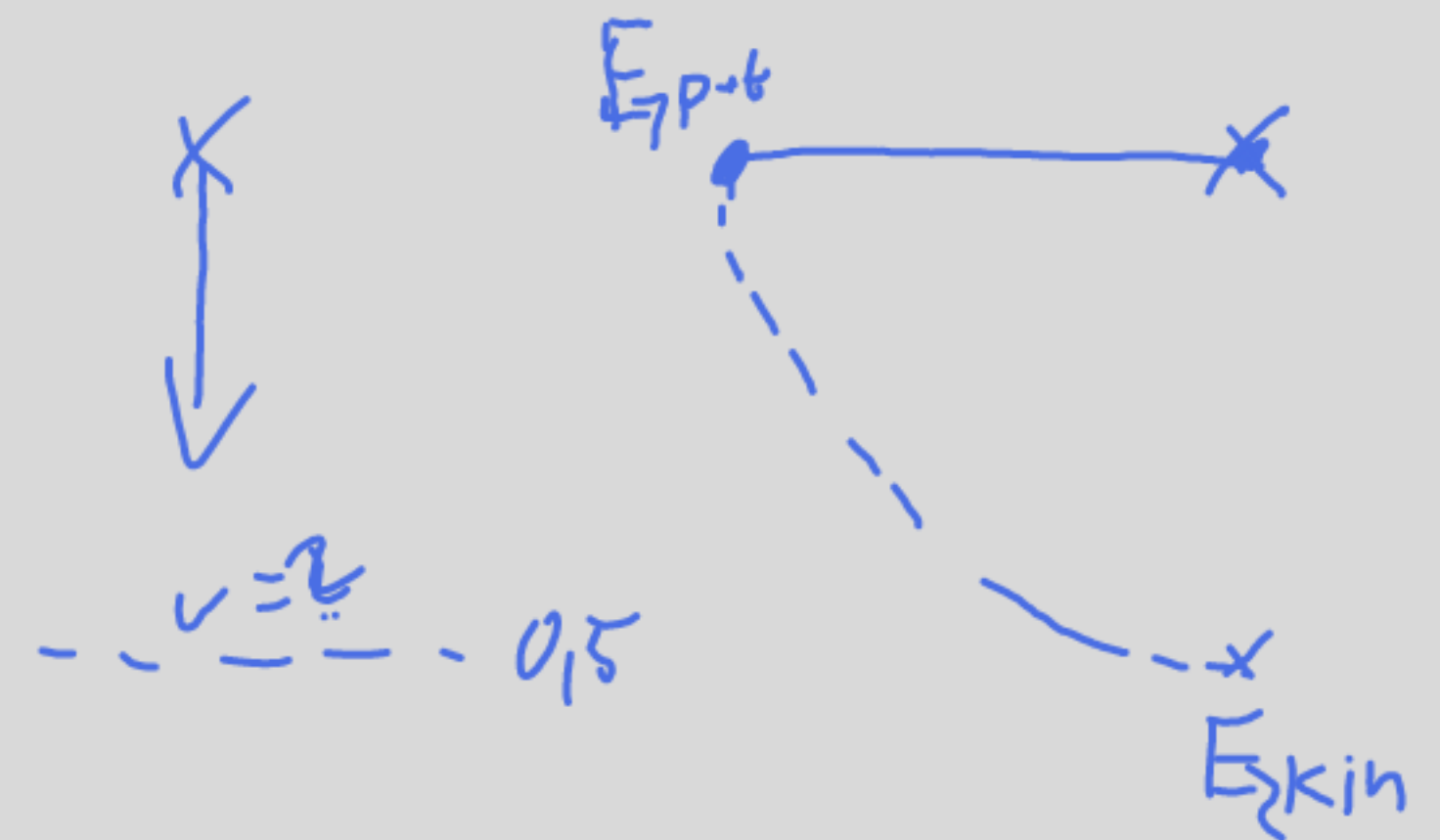
$$9,81 \frac{\text{m}}{\text{s}^2} \cdot 0,5\text{m} = \frac{1}{2} v^2$$

$$9,81 \frac{\text{m}^2}{\text{s}^2} = v^2$$

$$3,132 \frac{\text{m}}{\text{s}} = v$$

$$1 \cdot 2$$

$$\sqrt{\quad}$$



$$f = 440 \text{ Hz}$$

$$v = 20 \frac{\text{m}}{\text{s}}$$

$c$ : Schallgeschwindigkeit

$$f' = 440 \text{ Hz} \cdot x \quad | \quad x > 1$$

$$f' = f \cdot x$$

$$f' = f \cdot \left( \frac{c + v}{c} \right)$$

$$f' = 440 \text{ Hz} \cdot \left( \frac{343 \frac{\text{m}}{\text{s}} + 20 \frac{\text{m}}{\text{s}}}{343 \frac{\text{m}}{\text{s}}} \right)$$

$$= 465,66 \text{ Hz}$$

$$f_1 = 400 \text{ Hz}$$

$$f_2 = 402 \text{ Hz}$$

$$f_{\text{Schw}} = |f_1 - f_2| = 2 \text{ Hz}$$





