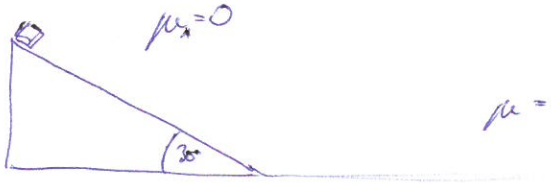
Jg. 2.



T. $v_0 = 5 \frac{m}{s}$

$\alpha = 30°$

$l = 2\,m \rightarrow h_0 = 1\,m$

---

a) (4)

$\Sigma E_{mech} = \Sigma E'_{mech}$ (1P)

$mgh_0 + \frac{1}{2} m v_0^2 = \frac{1}{2} m v^2 \;/ \cdot m$ (1P)

$\sqrt{2gh_0 + v_0^2} = v$ (1p)

$6{,}7 \frac{m}{s} \simeq v$ (1p)

$\vec{\Sigma F} = m \cdot \vec{a}$ 1P

$F_R = \mu \cdot F_N = 0$ 1p

$F_{ABT} = m \cdot g \cdot \sin 30°$ 1p

$a = \frac{\Delta v}{\Delta t} \rightarrow v = 6{,}7 \frac{m}{s}$ 1p

b) (4)

$\Sigma W = \Delta E_{kin}$ (1P)

$-F_{REIB} = 0 - \frac{1}{2} m v^2$ (1P)

$\mu \cdot m \cdot g \cdot s = \frac{1}{2} m v^2$ (1p)

$s = \frac{v^2}{2\mu \cdot g} \simeq 7{,}6\,m$ (1P)

c) (2)

$s = \frac{a}{2} t^2$

$a = \frac{\Delta v}{\Delta t}$

$\rightarrow s = \frac{v_0 + v}{2} \cdot t$ (1p)

$\frac{2s}{v} = t = 2{,}26\,s$ (1p)

Jg. 2.

II. $A = 10\,cm^2 = 0{,}001\,m^2$

$\Delta l_1 = 1\,cm$

$\Delta l_2 = 1{,}2\,cm$

$p_0 = 10^5\,Pa$

$T = konst.$

$G = ?$

$V_1 = ?$

a) (4)

Abb. 1: $p_1 = p_0 + \frac{G}{A}$

Abb. 2: $p_2 = p_0$

Abb. 3: $p_3 = p_0 - \frac{G}{A}$ } (1P)

$T = konst \Rightarrow$ $p_1 V_1 = p_2 V_2 = p_0 V_3$ (1P)

$\left(p_0 + \frac{G}{A}\right) \cdot A \cdot h_1 = p_0 \cdot A (h_1 + \Delta l_1)$ (1P) | $p_0 A (h + \Delta l_1) = \left(p_0 - \frac{G}{A}\right)(h + \Delta l_1 + \Delta l_2)$ (1P)

$\frac{G}{A} \cdot h_1 = p_0 \Delta l_1$

$p_0 \Delta l_2 = \frac{G}{A}(h_1 + \Delta l_1 + \Delta l_2)$ (1P) ↑ ↘ *

$* : \quad \frac{p \cdot (\Delta l_2 - \Delta l_1) \cdot A}{\Delta l_1 + \Delta l_2} = \underline{\underline{G = 9{,}1\,N}}$ (1P) (1P)

b) (3) $\left(p_0 + \frac{G}{A}\right) \cdot h_1 = p_0 (h_1 + \Delta l_1) \rightarrow h_1 = \frac{p_0 \Delta l_1 \cdot A}{G} \rightarrow \underline{\underline{h_1 \cong 11\,cm^3}}$

(1P) (1P) (1P)

Im Teil b) kann der maximale Punkt auch gegeben werden, wenn das Kind mit falschem G-Wert rechnet!

Jg 2.

III.

$h_0 = 10\,m$

$m_T = 80\,kg$ } $m_{ges} = 140\,kg$

$m_J = 60\,kg$

$v_0 = 0$

$v_{max_T} = ?$

$v_{ges} = ?$

$h_{max} = ?$

a) (4)

$\Sigma E_{mech} = \Sigma E'_{mech}$ (1P)

$m_T g h_0 = \frac{1}{2} m_T v_{max_T}^2$ (1P)

$\sqrt{2gh_0} = v_{max_T}$ (1P)

$14 \frac{m}{s} \approx v_{max_T}$ (1P)

b) (3)

$\Sigma \vec{I} = \Sigma \vec{I}'$ (1P)

$m_T v_{max_T} + m_J \cdot 0 = (m_T + m_J) \cdot v_g$ (1P)

$\frac{80 \cdot 14}{80+60} \approx 8 \frac{m}{s} = v_g$ (1P)

c) (3)

$\Sigma E_{mech} = \Sigma E'_{mech}$ (1P)

$\frac{1}{2} m_{ges} \cdot v_g^2 = m_{ges} \cdot g \cdot h_{max}$ (1P)

$\frac{v_g^2}{2g} = h_{max} \approx 3{,}2\,m$ (1P)