$\Rightarrow \underbrace{\bar{G}_1 + \bar{N}_1}_{=\bar{0}} + \bar{F}_\mu + \bar{F}_{N1} + \underbrace{\bar{F}_1 + \bar{F}_2}_{=\bar{0}} + \underbrace{\bar{G}_2 + \bar{N}_2}_{=\bar{0}} + \bar{F}_{N2} = (m_1+m_2)\bar{a}$ (vektorisyhtälö)

$\Rightarrow F_\mu - F_{N1} - F_{N2} = (m_1+m_2)a$

$\Leftrightarrow F_{N2} = F_\mu - F_{N1} - (m_1+m_2)a$

$= 4{,}3\cdot 10^3\,N - 0{,}25\cdot 10^3\,N - (1760\,kg + 440\,kg)\cdot 1{,}4\,\frac{m}{s^2}$

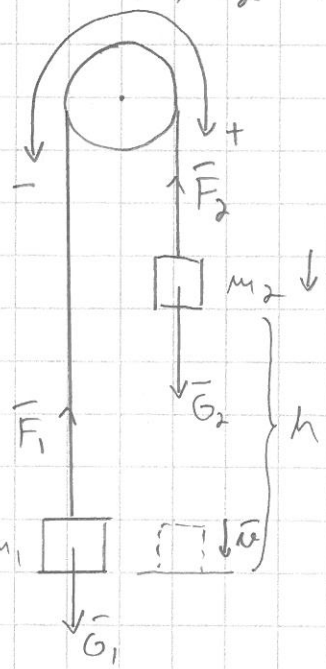
$= \underline{970\,N}$

b) NII $\sum \bar{F} = m\bar{a}$ m_2:een

$\sum F_x = F_2 - F_{N2} = m_2 a$

$\Leftrightarrow F_2 = F_{N2} + m_2 a = 970\,N + 440\,kg\cdot 1{,}4\,\frac{m}{s^2} = 1586\,N \simeq \underline{1{,}6\,kN}$

7.14



$m_1 = 7{,}0\,kg$ $m_2 = 9{,}0\,kg$ $h = 1{,}0\,m$

a) Jäletään ilmanvastus pieneä huomiotta. Kappaleilla on koko ajan sama nopeus → niillä on sama kiihtyvyys.

$F_1 = F_2$ (NIII TAI: sama lanka → sama jännitys)

NII: $\sum \bar{F} = m\bar{a}$ koko systeemiin

$\bar{G}_1 + \underbrace{\bar{F}_1 + \bar{F}_2}_{=\bar{0}} + \bar{G}_2 = (m_1+m_2)\bar{a}$ (vektorimuoto)

$\Rightarrow -m_1 g + m_2 g = (m_1+m_2)a \quad | : (m_1+m_2)$

$\Leftrightarrow a = \frac{g(m_2-m_1)}{m_1+m_2} = \frac{9{,}81\,\frac{m}{s^2}\,(9{,}0\,kg - 7{,}0\,kg)}{7{,}0\,kg + 9{,}0\,kg} \simeq 1{,}22625\,\frac{m}{s^2}$

$\simeq \underline{1{,}2\,\frac{m}{s^2}}$

NII: $\sum \bar{F} = m\bar{a}$ m_1:een

$\Rightarrow \bar{F}_1 + \bar{G}_1 = m_1\bar{a}$

$\Rightarrow F_1 - G_1 = F_1 - m_1 g = m_1 a$

$\Leftrightarrow F_1 = m_1 g + m_1 a = 7{,}0\,kg\,(9{,}81\,\frac{m}{s^2} + 1{,}22625\,\frac{m}{s^2})$

$\simeq 77{,}2538\,N \simeq \underline{77\,N}$

b) $\begin{cases} v = \underbrace{v_0}_{=0} + at = at \\ h = \underbrace{v_0 t}_{=0} + \frac{1}{2}at^2 = \frac{1}{2}at^2 \quad | \cdot \frac{2}{a} \quad | \sqrt{} \end{cases}$ myös $\Leftrightarrow t = \pm\sqrt{\frac{2h}{a}}$

$\Rightarrow v = at = \sqrt{\frac{2h}{a}}\cdot a = \ldots \simeq 1{,}56605\,\frac{m}{s} \simeq \underline{1{,}6\,\frac{m}{s}}$

7.10

$m = 58\,kg$ $a = 1{,}9\,\frac{m}{s^2}$

NII: $\sum \bar{F} = \bar{N} + \bar{G} = m\bar{a}$

$\Rightarrow N - G = N - mg = ma \quad \Leftrightarrow N = mg + ma$