

AF, 26.10.2010

$$\begin{aligned} \textcircled{1} \quad E_{\text{pot}} &= E_{\text{kin}} \\ mgh &= \frac{1}{2}mv^2 \\ h &= \frac{v^2}{2g} = 39.3275 \text{ m} \approx \underline{\underline{39.33 \text{ m}}} \\ &\quad \underline{\underline{15.5628 \text{ m}}} \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad E &= mgh = F \cdot s \\ \frac{mgh}{s} &= F \quad | : m \\ \frac{gh}{s} &= \frac{F}{m} = \underline{\underline{50.4234 \text{ m/s}^2}} = \underline{\underline{5.14g}} \end{aligned}$$

$$v: \quad v = \sqrt{2gh} = \sqrt{2 \cdot g \cdot 5.14} = \underline{\underline{10.0423 \text{ m/s}}}$$

$$\begin{aligned} \textcircled{3} \quad v &= 15 \text{ m/s}; \quad t = 0.06 \text{ s} \\ s &= \frac{1}{2}at^2 \quad \frac{v^2}{2s} = a \end{aligned}$$

$$s = \frac{1}{2} \frac{v^2}{2s} \cdot t^2$$

$$s^2 = \frac{1}{4} v^2 t^2$$

$$s = \frac{1}{2} vt$$

↳ gleichm. Besch.:  $\bar{v} = \frac{1}{2}v$  !

einfacher:  $v = a \cdot t$

$$a = \frac{v}{t} = \frac{15 \text{ m/s}}{0.06 \text{ s}} = 250 \text{ m/s}^2$$

$$s = \frac{v^2}{2a} = \underline{\underline{0.45 \text{ m}}}$$

$$\textcircled{4} \quad \bar{F} = m \cdot a \Rightarrow m = \frac{\bar{F}}{a} = 160 \text{ kg}$$

$$\textcircled{5} \quad \bar{F} = m \cdot a \Rightarrow a = \frac{\bar{F}}{m}$$

$$v = a \cdot t \Rightarrow t = \frac{v}{a}$$

$$\Rightarrow t = \frac{v}{\bar{F}/m} = 50 \text{ s}$$

$$\textcircled{6} \quad m = 84000 \text{ kg}, v = 260 \text{ km/h} = 72.2 \text{ m/s}$$

$$\mu = 0.12$$

$$\bar{F}_B = \mu mg$$

$$a_B = \frac{\bar{F}_B}{m} = \mu \cdot g = \underline{\underline{1.1772 \text{ m/s}^2}}$$

$$\bar{F}_B = m \cdot a_B = \underline{\underline{98.88 \text{ kN}}}$$

$$\text{a) mit Energie: } \frac{1}{2}mv^2 = \mu mg s$$

$$s = \frac{v^2}{2\mu g} = 215.45 \text{ m}$$

$$\textcircled{7} \quad a = \frac{v^2}{2s}$$

$$\bar{F} = m \cdot a = m \cdot \frac{v^2}{2s} = \mu mg$$

$$\mu = \frac{v^2}{2gs} = \underline{\underline{0.72}}$$