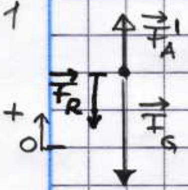
Name	Klasse	Datum		Seite / Blatt
Holzklotz				

1.1 $|\vec{F}_A| = |-\vec{F}_G|$; $F_A = \rho_{Fe} \cdot g V = \rho_{Fe} \cdot g \cdot b^2 \cdot h_0$

Also $\rho_{Fe} g b^2 h_0 = m g \iff \rho_{Fe} b^2 h_0 = \rho b^3$ $\quad (m_H = \rho_H V_H = \rho_H b^3)$

$$h_0 = \frac{\rho_H b^3}{\rho_{Fe} b^2} = \frac{\rho_H}{\rho_{Fe}} \cdot b = \underline{6{,}0 \text{ cm}}$$

1.3.1 $\vec{F}_{Rü} = \vec{F}_A' + \vec{F}_G$ bzw. $F_{Rü} = F_A' - F_G$ (Koordinaten)



$$F_{Rü} = g \rho_{Fe} b^2 (h_0 - s) - g \rho_H b^3 \quad \hat{=}\ F_A(\text{von } 1.1) - F_G = 0$$

$$F_{Rü} = g \rho_{Fe} b^2 h_0 - g \rho_{Fe} b^2 s - g \rho_H b^3 \quad \text{(vgl. Vert. Feder)}$$

$$\underline{F_{Rü} = -g \rho_{Fe} b^2 s}$$

1.3.2 Max Amplitude: 4,0 cm (Dann ganz eingetaucht und $F_{Rü}$ = konst

Lineares Kraftgesetz ⇒ harmon. Kraftgesetz ⇒ $s(t) = A \cdot \sin()$ ...

1.3.3 $T = 2\pi \sqrt{\frac{m}{D}}$; $D = g \rho_{Fe} b^2$ (1.3.1) ; $m = \rho_H \cdot V = \rho_H b^3$

$$T = 2\pi \sqrt{\frac{\rho_H b^3}{\rho_{Fe} \cdot b^2 g}} = \underline{2\pi \sqrt{\frac{\rho_H \cdot b}{\rho_{Fe} \cdot g}}}$$

1.3.4 $$T = 2\pi \sqrt{\frac{0{,}60 \cdot 0{,}10 \text{ m}}{1{,}0 \cdot 9{,}81 \text{ m/s}^2}} = \underline{0{,}49 \text{ s}}$$

1.4.1 $E_{ges} = \frac{1}{2} D s_{max}^2 = \frac{1}{2} D A^2$; Lin. Kraftges. $F_{max} = DA \iff A = \frac{F_{max}}{D}$

$$= \frac{1}{2} D \left(\frac{F_{max}}{D}\right)^2 = \frac{1}{2} \frac{F_{max}^2}{D} = \frac{1}{2} \frac{F_{max}^2}{g \rho_{Fe} b^2}$$

$$= \frac{1}{2} \cdot \frac{(2{,}9 \text{ N})^2}{9{,}81 \text{ N kg}^{-1}\, 1{,}0 \cdot 10^3 \text{ kg} \cdot \text{m}^{-3} \cdot (0{,}1 \text{ m})^2} = \underline{0{,}043 \text{ J} = 43 \text{ mJ}}$$

m^{-1}

1.4.2 $F(t) = -m a(t) = -m \cdot A\omega^2 \cos(\omega t) = -m\omega A \omega \cos(\omega t)$

$v(t) = -A\omega \sin(\omega t)$; $F_{max} = m\omega A\omega \iff A\omega = \frac{F_{max}}{m\omega}$

$$= -\frac{F_{max}}{m\omega} \sin(\omega t) = -\frac{2{,}9 \text{ N}}{\rho_H \cdot b^3 \cdot g \cdot \omega} \sin(\omega t) = \underline{-0{,}38 \tfrac{\text{m}}{\text{s}} \sin(\omega t)}$$

$\omega = 4{,}1\pi \cdot \text{s}^{-1}$