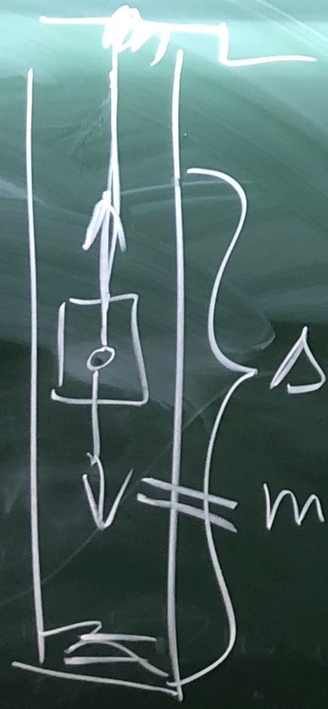
5/5

$v = 50\,cm/s = 95\,\frac{m}{s}$



$\Sigma F = 0$ da $a = 0$

a) $|F_{zug}| = |F_{gewicht}| = m \cdot g =$

b) $W = F \cdot \Delta s \cdot \cos\alpha = m \cdot g \cdot 8m \cdot \cos 0 =$

c) $P = \frac{W}{\Delta t} = \frac{W}{\Delta s} \cdot v = \ldots$

$v = \frac{\Delta s}{\Delta t} \rightarrow \Delta t = \frac{\Delta s}{v}$

6 / 2

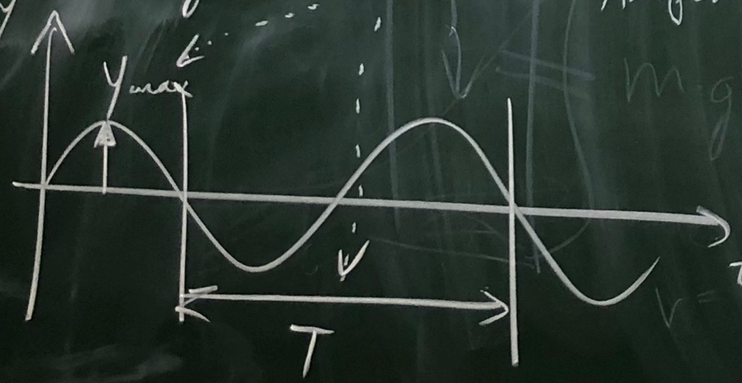
$p_t = p_{Luft} + p_{Wasser} = 101325\ Pa + \rho \cdot g \cdot \Delta h =$

$1080 \frac{kg}{m^3}$ $9{,}81 \frac{m}{s^2}$ $1000\,m$

Ein schwingendes System zwei wichtige Charakteristiken:

— $T = \frac{1}{f}$ ← Zusammensetzung

— Amplitude ← Energie



$f = \frac{1}{2\pi} \cdot \sqrt{\frac{k}{m}}$ $\quad T = 2\pi\sqrt{\frac{m}{k}}$

k und m

l und g ← $f = \frac{1}{2\pi}\sqrt{\frac{g}{l}}$ $\quad T = 2\pi\sqrt{\frac{l}{g}}$

L C ← $f = \frac{1}{2\pi}\sqrt{\frac{1}{LC}}$ $\quad T = 2\pi\sqrt{L\,C}$

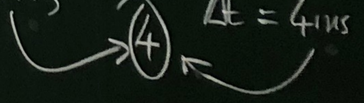
$\Delta y \sim$ Lageenergie

$v \sim$ kin Energie

$a \sim F$

7/1 $\quad 160\ min^{-1} = 160\ (60\,s)^{-1} = 160 \times 60^{-1} \cdot s^{-1} = \frac{160}{60} \cdot \frac{1}{s} = \frac{160}{60}\ Hz$

7/6 $\quad f = 1000\ Hz \rightarrow T = \frac{1}{1000}\ s = 1\ ms$



7.10

$y = 3\,cm \cdot \sin(0{,}5\ s^{-1} \cdot t)$

$y = y_{max} \cdot \sin(\omega \cdot t + y_0)$

a) $A = y_{max} = 3\,cm = 0{,}03\,m$

b) $\omega = 0{,}5\ s^{-1}$

c) $\omega = 2\pi f \rightarrow f = \frac{\omega}{2\pi} = \frac{0{,}5\ s^{-1}}{2\pi} = \ldots$

d) $T = \frac{1}{f} = \ldots$

e) $v_{max} = y_{max} \cdot \omega = \ldots$

f) $a_{max} = v_{max} \cdot \omega = y_{max} \cdot \omega^2 = \ldots$

g1) $y_t = y_{max} \cdot \sin(\omega \cdot t) = \ldots$

g2) $v_t = y_{max} \cdot \omega \cdot \cos(\omega \cdot t) = \ldots$

g3) $a_t = -y_{max} \cdot \omega^2 \cdot \sin(\omega \cdot t) = \ldots$

7.11

$T_1 = 2\pi \cdot \sqrt{\frac{m_1}{k}}$

$T_2 = 2\pi \cdot \sqrt{\frac{m_1 - 0{,}5\,kg}{k}}$

$\left(\frac{T_1}{2\pi}\right)^2 = \frac{m_1}{k}$

$\left(\frac{T_2}{2\pi}\right)^2 = \frac{m_1 - 0{,}5\,kg}{k}$

$k = \frac{m_1}{\left(\frac{T_1}{2\pi}\right)^2}$

$k = \frac{m_1 - 0{,}5\,kg}{\left(\frac{T_2}{2\pi}\right)^2}$

$\frac{2^2}{3^2} = \frac{4}{9}$

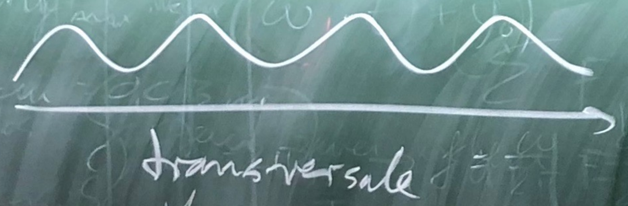
$\frac{m_1}{\left(\frac{T_1}{2\pi}\right)^2} = \frac{m_1 - 0{,}5\,kg}{\left(\frac{T_2}{2\pi}\right)^2}$

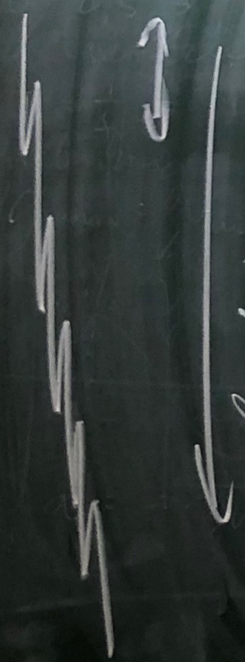
$\frac{T_2^2}{T_1^2} \cdot m_1 = 1 \cdot m_1 - 0{,}5\,kg$

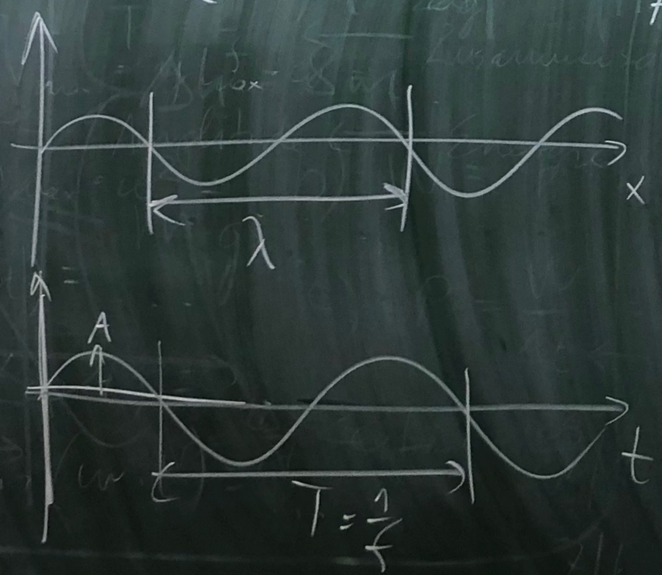
$\frac{4}{9} m_1 - \frac{9}{9} m_1 = -0{,}5\,kg$

$\frac{5}{9} m_1 = -0{,}5\,kg$

$m_1 = 0{,}5\,kg \cdot \frac{9}{5} = 0{,}9\,kg$







$$v = \frac{ds}{dt}$$

$$c = \frac{\lambda}{T} = \lambda f$$

$$A_r^2 = A_1^2 + A_2^2 + 2A_1 A_2 \cos\Delta\varphi$$

$A_1 = A_2 = A$

gleich: $\Delta\varphi = 0$ $\quad \cos\Delta\varphi = 1$

$$A_r^2 = A^2 + A^2 + 2 \cdot A \cdot A \cdot 1 = 4A^2$$

$A_r = 2A$ max. konstr. Interferenz!

gegensätzlich $\Delta\varphi = 180°$ $\quad \cos\Delta\varphi = -1$

$$A_r^2 = A^2 + A^2 + 2 \cdot A \cdot A \,(-1) = 0$$

$A_r = 0$ max. destr. Interferenz