

AP 2009 / III

$$2.1: T = 2\pi \sqrt{\frac{m}{D}} \Leftrightarrow T^2 = 4\pi^2 \frac{m}{D} \Leftrightarrow D = \frac{4\pi^2 m}{T^2}$$

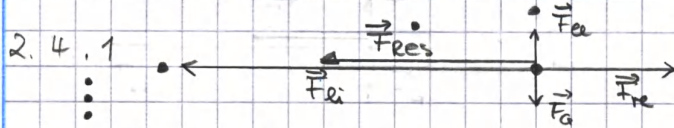
$$\bullet D = \frac{4\pi^2 \cdot 0,140 \text{ kg}}{(0,50 \text{ s})^2} = 22,11 \frac{\text{N}}{\text{m}} = \underline{22 \frac{\text{N}}{\text{m}}}$$

$$2.2: x(t) = A \cdot \cos(\omega t) = A \cdot \cos\left(\frac{2\pi}{T} \cdot t\right) = \underline{8,0 \text{ cm} \cdot \cos\left(4\pi \frac{1}{5} \cdot t\right)}$$

$$2.3 \bullet v(t) = -A \omega \sin(\omega t) = -8,0 \text{ cm} \cdot 4\pi \cdot \frac{1}{5} \cdot \sin\left(4\pi \frac{1}{5} \cdot t\right)$$

$$\bullet v(0,18 \text{ s}) = -32\pi \frac{\text{m}}{\text{s}} \cdot \sin\left(4\pi \frac{1}{5} \cdot 0,18 \text{ s}\right) = -77,46 \frac{\text{cm}}{\text{s}} = -0,77 \frac{\text{m}}{\text{s}}$$

$$\bullet |v| = \underline{0,77 \frac{\text{m}}{\text{s}}}; \text{ Bew. erfolgt n. links} \quad (3,87 \text{ im Deg.})$$



$$2.4.2 \bullet \vec{F}_{\text{res}} = \vec{F}_{\text{re}} + \vec{F}_{\text{ei}} \quad \text{bzw.} \quad F_{\text{res}} = -F_{\text{ei}} + F_{\text{re}}$$

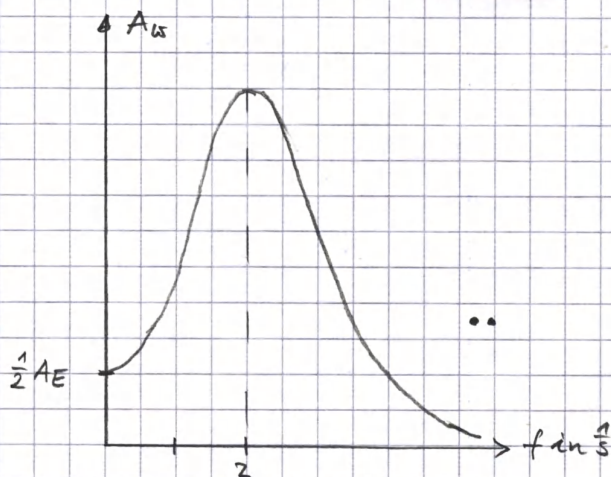
$$\bullet -Dx = -D_0(l+x) + D_0(l-x)$$

$$\bullet -Dx = -2D_0x$$

$$\bullet D_0 = \frac{1}{2}D = \frac{1}{2} \cdot 22 \frac{\text{N}}{\text{m}} = \underline{11 \frac{\text{N}}{\text{m}}}$$

$$2.5 \quad f_0 = \frac{1}{T} = \frac{1}{0,50 \text{ s}} = \underline{2,0 \frac{1}{\text{s}}}$$

bla...



$$\bullet f_E \ll f_0: A_w \approx \frac{1}{2} A_E$$

$$\bullet f_E \approx f_0: A_w \text{ maximal}$$

$$f_E \gg f_0: A_w \rightarrow 0$$

- Resonanz

... bla