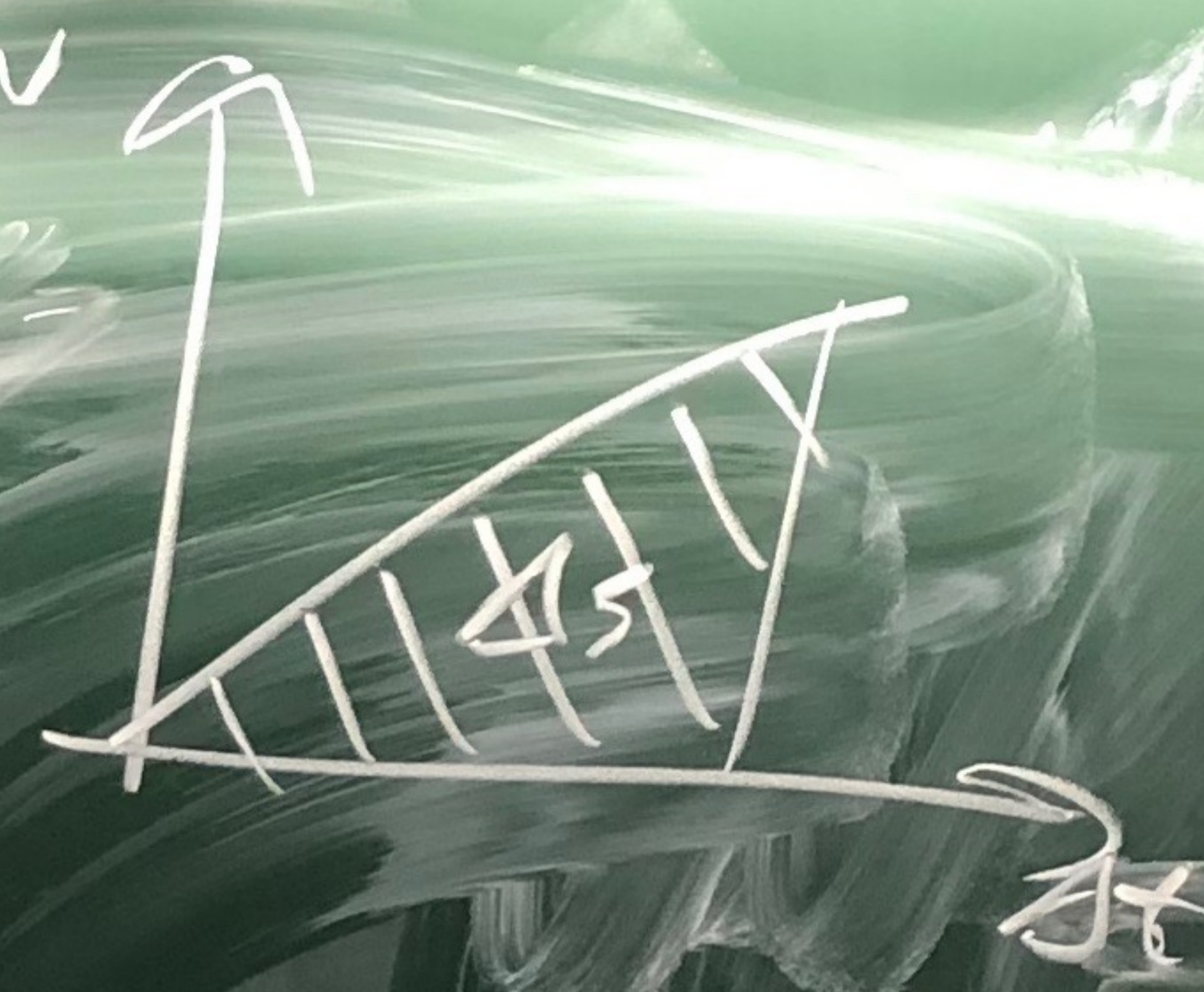


$$\Delta s = \frac{a}{2} \cdot t^2$$

$$W = F \cdot \Delta s = m \cdot a \cdot \Delta s \quad \Delta s = \frac{\Delta v \cdot \Delta t}{2} \rightarrow$$

$$\Delta s = \frac{1}{2} a \cdot \Delta t$$



$$\Delta s = \frac{\Delta v \cdot \Delta t}{2} = \frac{\Delta v \cdot \Delta v}{2a}$$

$$\frac{\Delta v}{\Delta t} = a$$

$$\Delta t = \frac{\Delta v}{a}$$

$$\Delta s \cdot a = \frac{\Delta v^2}{2}$$

$$W = m \cdot \frac{\Delta v^2}{2}$$

$$P = \frac{\Delta F}{\Delta A}$$

$$[P] = \frac{[F]}{[A]} = \frac{N}{m^2} = Pa$$

$$1 \text{ atm} = 101325 Pa$$

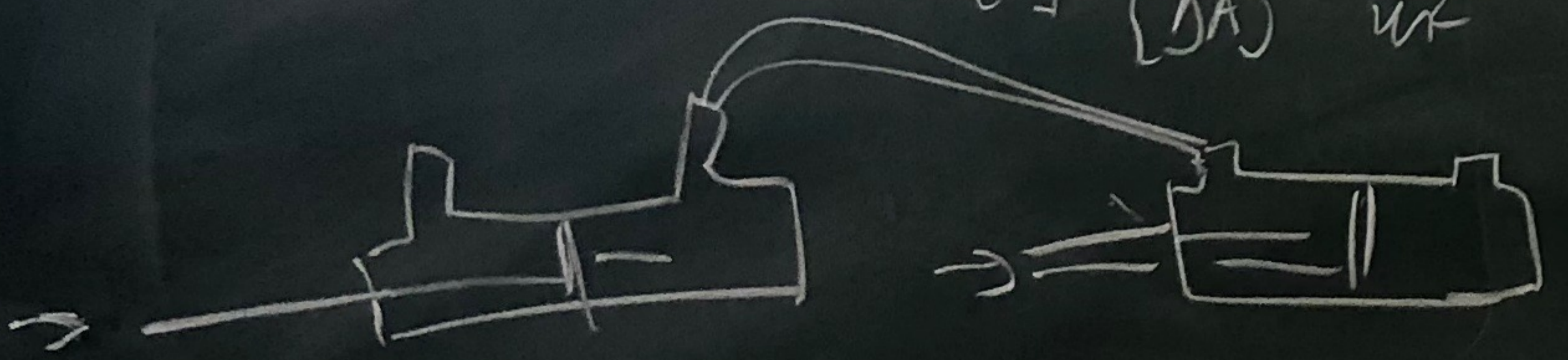
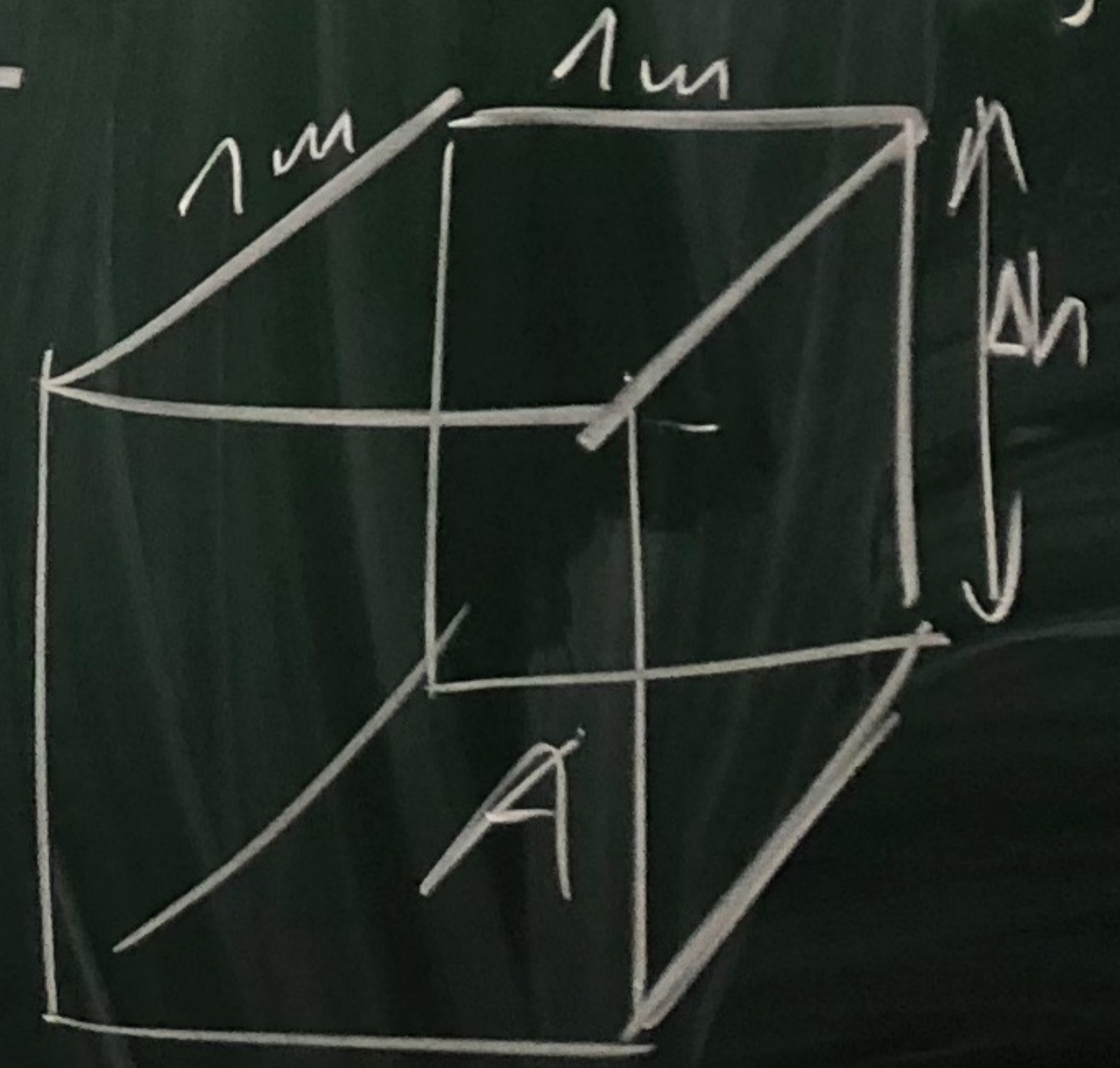
$$1 \text{ mmHg} = 133 Pa$$

$$1 \text{ bar} = 100000 Pa$$

$$\frac{F}{A} = \frac{\rho \cdot g}{A} = \frac{\rho \cdot A \cdot \Delta h \cdot g}{A} = \rho \cdot g \cdot \Delta h$$

$$\rho = \frac{m}{V} = \frac{m}{A \cdot \Delta h}$$

$$m = \rho \cdot A \cdot \Delta h$$

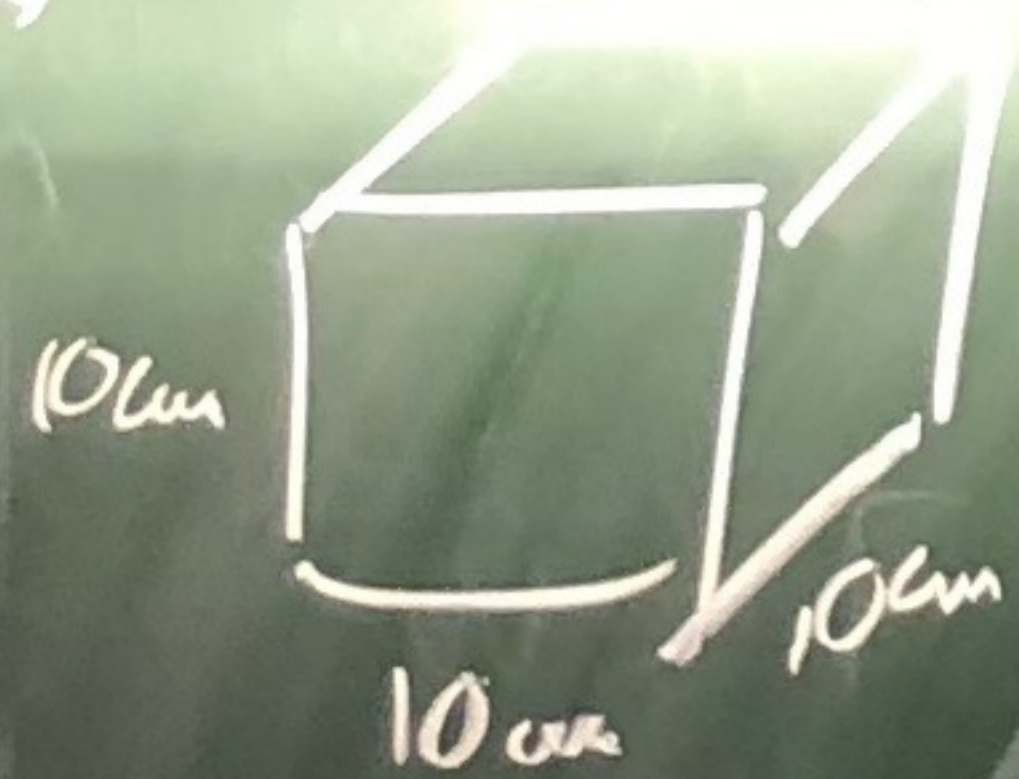


$$F = 100 N$$

$$A = 1 \text{ mm}^2 = (10^{-3} \text{ m})^2$$

$$P = \frac{100 \text{ N}}{1 \text{ mm}^2} = \frac{100}{10^{-6}} Pa$$

6/5



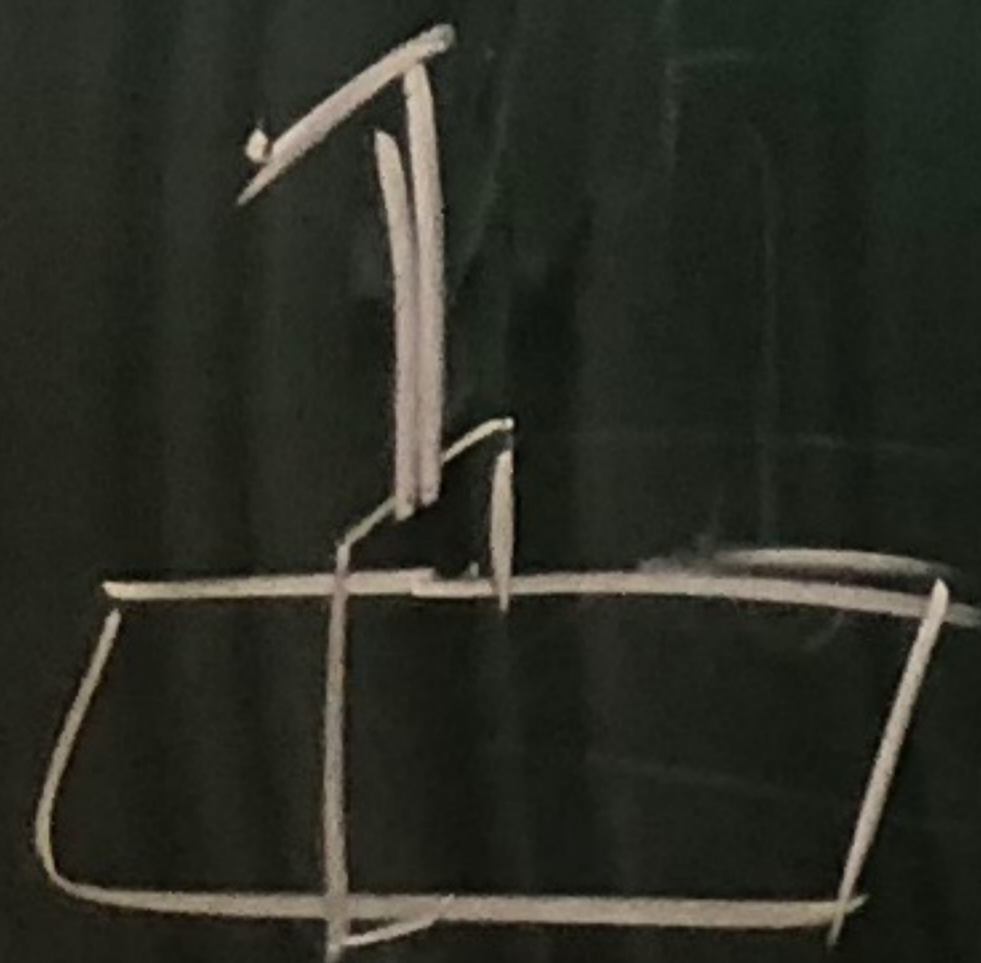
$$\rho = \frac{m}{V}$$

$$m = \rho \cdot V$$

$$V = 1000 \text{ cm}^3$$

$$\rho = 19,3 \text{ g/cm}^3$$

$$= 19300 \text{ g} = 19,3 \text{ kg}$$

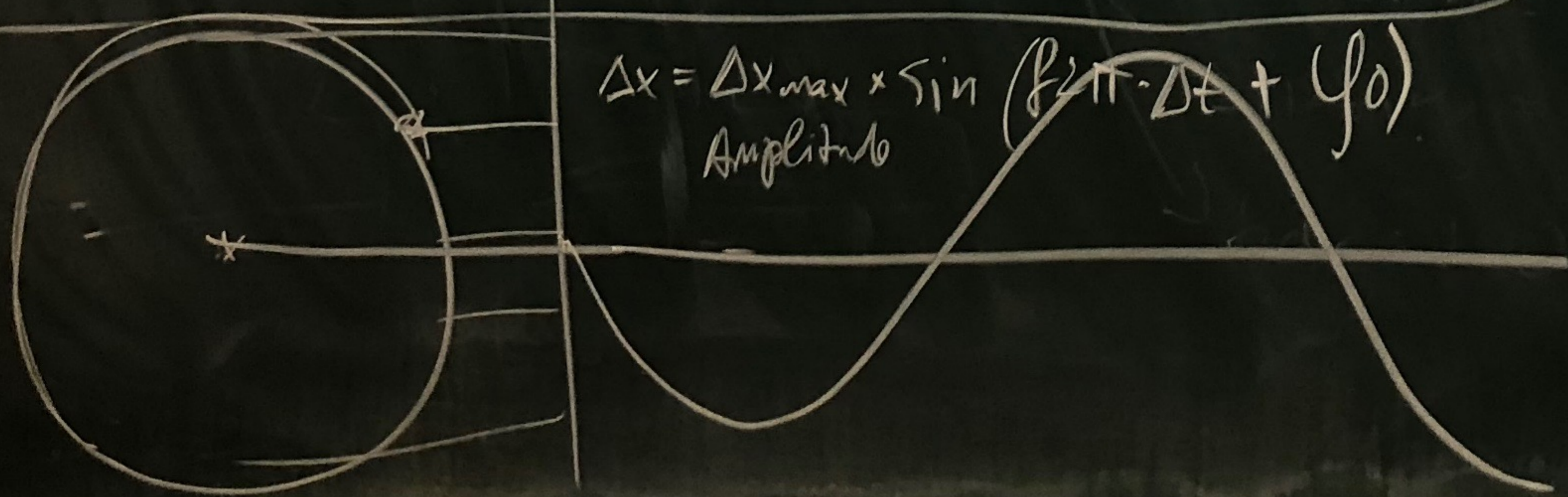


$$A = 100 \text{ cm}^2 = 0,01 \text{ m}^2$$

$$p = \frac{F}{A} = \frac{mg}{A} = \frac{19,3 \text{ kg} \cdot 9,81 \frac{\text{m}}{\text{s}^2}}{0,01 \text{ m}^2}$$

$$\Delta x = \Delta x_{\text{max}} \times \sin(2\pi \cdot \Delta t + \varphi_0)$$

Amplitude



$$6/8 \quad D = 4000 \frac{\text{N}}{\text{m}}$$

$$a) \quad \Delta x = 5,1 \times 10^{-3} \text{ m}$$

$$D = \frac{\Delta F}{\Delta x} \Rightarrow \Delta F = D \cdot \Delta x = 4000 \frac{\text{N}}{\text{m}} \times 5,1 \times 10^{-3} \text{ m} = 20,4 \text{ N}$$

$$p = \frac{F}{A} \rightarrow \frac{20,4 \text{ N}}{2 \times 10^{-4} \text{ m}^2} = 10,2 \times 10^4 \frac{\text{N}}{\text{m}^2} = 1,02 \times 10^5 \frac{\text{N}}{\text{m}^2}$$

$$b) \quad P_{\text{hydro}} = \rho g h = 1000 \frac{\text{kg}}{\text{m}^3} \times 9,81 \frac{\text{m}}{\text{s}^2} \times 10 \text{ m}$$

$$P_{\text{T}} = P_{\text{hydro}} + P_{\text{atm}} = 9,81 \times 10^4 \text{ Pa} + 1,02 \times 10^5 \text{ Pa}$$

$$= 20,01 \times 10^4 \text{ Pa}$$

$$\Delta F = A \cdot p = 20,01 \times 10^4 \text{ Pa} \times 2 \times 10^{-4} \text{ m}^2 = 40,02 \text{ N}$$

$$\Delta x = \frac{\Delta F}{D} = \frac{40,02 \text{ N}}{4000 \frac{\text{N}}{\text{m}}} = 0,01 \text{ m} = 1 \text{ cm}$$