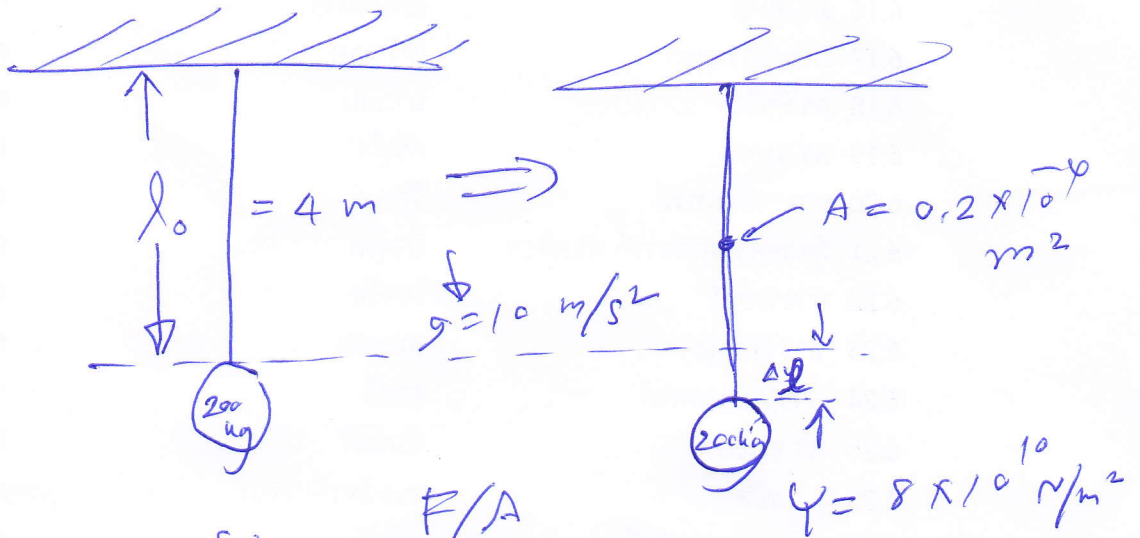


# စာမေးပွဲ

①



on

$$Y = \frac{F/A}{\Delta l/l_0}$$

$$\Delta l = \frac{F l_0}{Y A} = \frac{2000 \times 4}{8 \times 10^{10} \times 0.2 \times 10^{-4}}$$

$$= \frac{5 \times 10^3}{10^6} = 5 \times 10^{-3} \text{ m}$$

$$= 5 \text{ mm} \quad \#$$

②

α

$$Y = \frac{F/A}{\Delta l/l_0}$$

$$\text{အမြင့်ဆုံးအား} = \frac{\text{အား}}{\text{w.r.}} = \frac{F_{\max}}{A}$$

$$1.5 \times 10^8 = \frac{F_{\max}}{A} = \frac{F_{\max}}{\pi \left(\frac{2.5 \times 10^{-2}}{2}\right)^2}$$

$$F_{\max} = \frac{1.5 \times 10^8 \times \pi \times 2.5 \times 2.5 \times 10^{-4}}{4}$$

$$= 73593.75 \text{ N}$$

$$= 7.4 \times 10^4 \text{ N} \quad \#$$

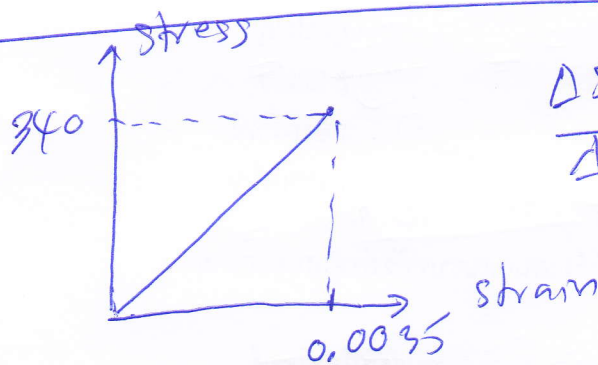
(b)  $\gamma = \frac{F/A}{\Delta l/l_0}$

$$1.5 \times 10^{10} = \frac{1.5 \times 10^8}{\frac{\Delta l}{l_0}}$$

$$\frac{\Delta l}{l_0} = \frac{1.5 \times 10^8}{1.5 \times 10^{10}} = 0.01$$

~~Answer~~  
 $\Delta l = 0.01 l_0 = 1\%$

(3)



$$\frac{\Delta \text{stress}}{\Delta \text{strain}} = \text{slope}$$

$$\text{slope} = \gamma = \frac{340 \times 10^6 \text{ N/m}^2}{0.0035}$$

$$= 9.7 \times 10^{10} \text{ N/m}^2$$

(4)

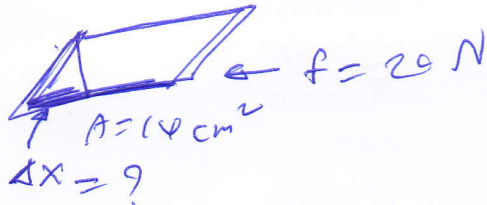
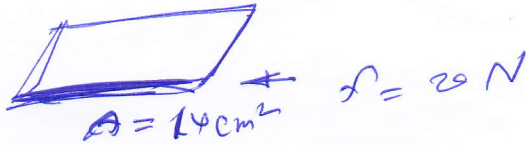
$$w.r. = A = \pi d^2$$

$$\gamma = \frac{F_1/A_1}{\Delta l/l_0} = \frac{F_2/A_2}{\Delta l/l_0}$$

$$\frac{F_1}{A_1} = \frac{F_2}{A_2} \Rightarrow \frac{A_2}{A_1} = \frac{F_1}{F_2}$$

$$\left(\frac{d_2}{d_1}\right)^2 = \frac{F_1}{F_2} = \frac{20 \text{ kN}}{200 \text{ kN}} = 100 \Rightarrow d_2 = 10d_1$$

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~~Shear modulus~~

$$\frac{F_{||}/A_{||}}{\Delta x/h} = \text{shear modulus}$$

~~$3 \times 10^6 \text{ N/m}^2$~~

$$= 3 \times 10^6 \text{ N/m}^2$$

$$\frac{\Delta x}{h} = \frac{F_{||}}{A_{||}} \frac{1}{3 \times 10^6}$$

$$\Delta x = \frac{20 \times 5 \times 10^{-3}}{14 \times 10^{-4} \times 3 \times 10^6} \text{ m}$$

$$= \frac{10^{-3}}{14 \times 3} \text{ m}$$

$$= 2.4 \times 10^{-5} \text{ m}$$

$$= 0.024 \text{ mm} \quad \#$$

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$$B = - \frac{\Delta P}{\Delta V/V_0}$$

1105  $\Delta V$   $\Delta V/V_0$  109  $m^3$   $\Delta P$   $\Delta P/V_0$  100  $m^3$

$$\frac{\Delta V}{V_0} = \left( \frac{-9}{109} \right) = \left( \frac{-0.09}{1.09} \right)$$

$$\Delta P = - \frac{B \Delta V}{V_0} = \frac{(-1.13 \times 10^8)(-0.09)}{1.09}$$
$$= 1.65 \times 10^8 \text{ N/m}^2$$

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$$B_w = - \frac{\Delta P}{\Delta V/V_0} = - \frac{\Delta P V_0}{\Delta V}$$

$$\Delta V = - \frac{\Delta P V_0}{B_w} = - \frac{1.13 \times 10^8 \text{ N/m}^2 \times 1 \text{ m}^3}{0.21 \times 10^{10} \text{ N/m}^2}$$

$$= -0.0538 \text{ m}^3$$

$\Delta V$   $\Delta V/V_0$

6

$$\Delta V = 1 \text{ m}^3 - 0.0538 \text{ m}^3$$
$$= 0.946 \text{ m}^3$$

~~1.03~~  $\Delta V$   $\Delta V/V_0$   $\Delta V/V_0 = \rho V$

$$= 1.03 \times 10^3 \times 1 \text{ kg}$$

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

$$\rho = \frac{m}{V} = \frac{1.03 \times 10^3}{0.946} \text{ kg/m}^3$$

$$= 1.09 \times 10^3 \text{ kg/m}^3$$