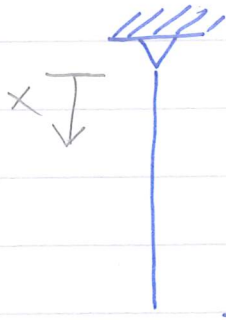


2.1.5

GIVET:



$$\rho = 7840 \text{ kg/m}^3$$

$$L_{\max}^? \quad \tau_{\max} = 200 \text{ MPa}$$

SÖKT: $L_{\max}^?$

LÖSNING:

1.- Friståg eller jämv:

$$[F.S.G.3] \quad \frac{dN}{dx} + k_x A = 0$$

$$k_x = \frac{Q}{LA} = \frac{\overbrace{pgAL}^{\text{totala tyngden}}}{\underbrace{AL}} = +pg \quad \swarrow \text{samma riktning som } x +$$

$$\frac{dN}{dx} + pgA = 0 \rightarrow N = -pgAx + C$$

$$N(L_{\max}) = 0 = -pgAL_{\max} + C$$

$$C = pgAL_{\max} \Rightarrow \boxed{N = pgA(L_{\max} - x)}$$

$$2.- \text{Spänning: } \tau = \frac{N}{A} = pg(L_{\max} - x)$$

$$\tau_{\max} = \frac{N_{\max}}{A} = pgL_{\max} \Rightarrow L_{\max} = \frac{\tau_{\max}}{pg}$$

$$L_{\max} = \frac{200 \cdot 10^6 \text{ Pa}}{\frac{7840 \text{ kg}}{\text{m}^3} \cdot 9,8 \frac{\text{m}}{\text{s}^2}}$$

$$L_{\max} = 2603 \text{ m}$$