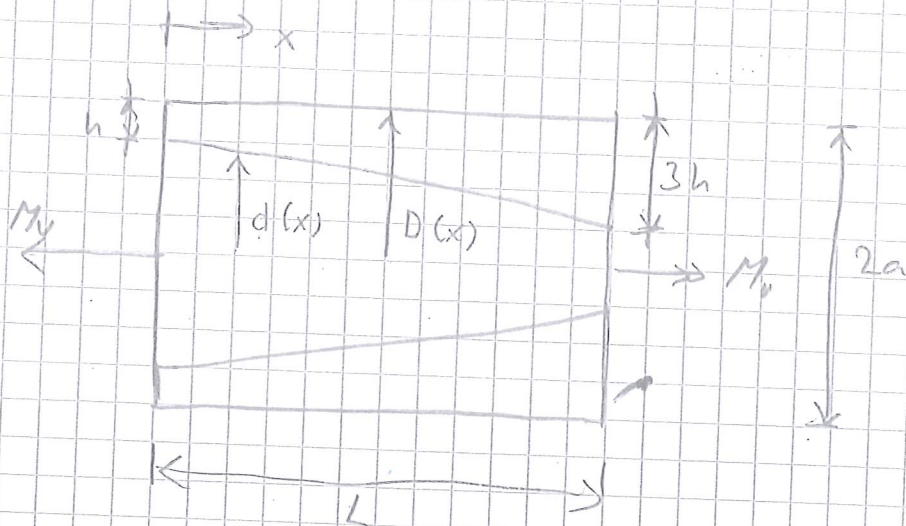


2.6.12



Given: linjärt elastiskt material (G), ($h \ll a, L$), tunnväggigt

Sök: total förvriddning pga M_x

HB: $\varphi = \frac{M_x}{GK}$; $K = K(x)$ förvriddning per längdenhet.

för konstant tvärsnitt: $K = 2\pi \left(\frac{at}{2} \right)^3 t$; $t = \text{tycklek}$

$$\left\{ \begin{aligned} t &= h + \frac{2hx}{L} \\ \frac{d}{2} &= (a-h) - \frac{2hx}{L} \approx a \end{aligned} \right.$$

$$\left\{ \begin{aligned} t &= h + \frac{2hx}{L} \\ \frac{d}{2} &= (a-h) - \frac{2hx}{L} \approx a \end{aligned} \right.$$

$$K(x) = 2\pi \left(\frac{a}{2} \left(a-h - \frac{2hx}{L} \right) \right)^3 \left(h + \frac{2hx}{L} \right) =$$

$$= 2\pi \left[\frac{a^4}{8} \left(a^2 + h^2 + \frac{4h^2x^2}{L^2} \right) \left(a-h - \frac{2hx}{L} \right) \right] \left(h + \frac{2hx}{L} \right) =$$

$$= 2\pi \left[a^3 - ah - \frac{2ahx}{L} + ah^3 - h^3 - \frac{2h^3x}{L} + \frac{4ah^2x^2}{L^2} - \frac{4h^3x^2}{L^2} - \frac{8h^3x^3}{L^3} \right] \left(h + \frac{2hx}{L} \right)$$

$h \ll a, L \Rightarrow$ stryk

$$= 2\pi \left[a^3 \right] \left(h + \frac{2hx}{L} \right)$$