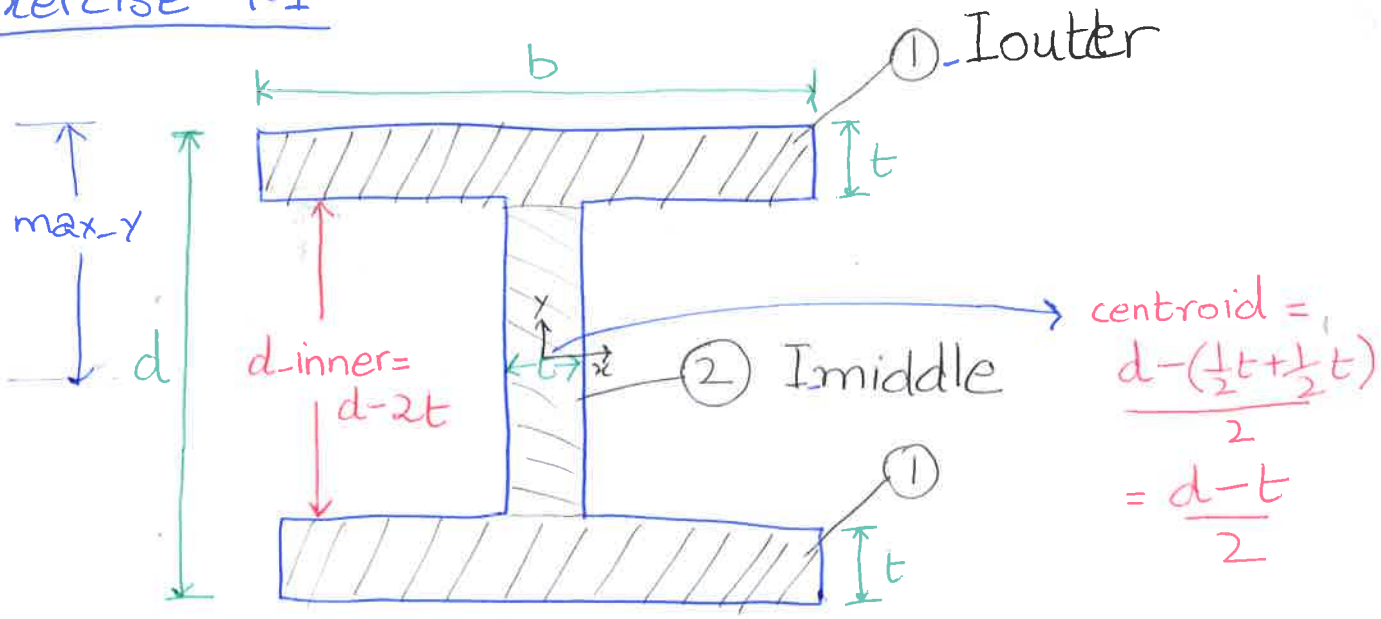
Exercise 4.1



Parallel axis theorem

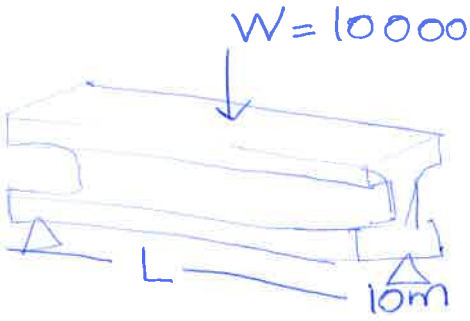
$$I = \frac{bd^3}{12} + Ay^2$$

$$I_{total} = \underbrace{I_{middle}}_{\frac{bd^3}{12}} + 2\underbrace{I_{outer}}_{\frac{bd^3}{12} + Ay^2}$$

$$= \frac{t * d\_inner^3}{12} + 2\left(\frac{b * t^3}{12} + (b \times t) * \left(\frac{d-t}{2}\right)^2\right)$$

Assume

$d = 100.0$ mm
$b = 50.0$ mm
$t = 5.0$ mm



$$M = \frac{WL}{4} \text{ Nm}$$

$$= \frac{WL}{4} * 1.0e^3 \text{ Nmm}$$

$$max\_y = d/2$$

$$\sigma = \frac{M * max\_y}{I\_total}$$