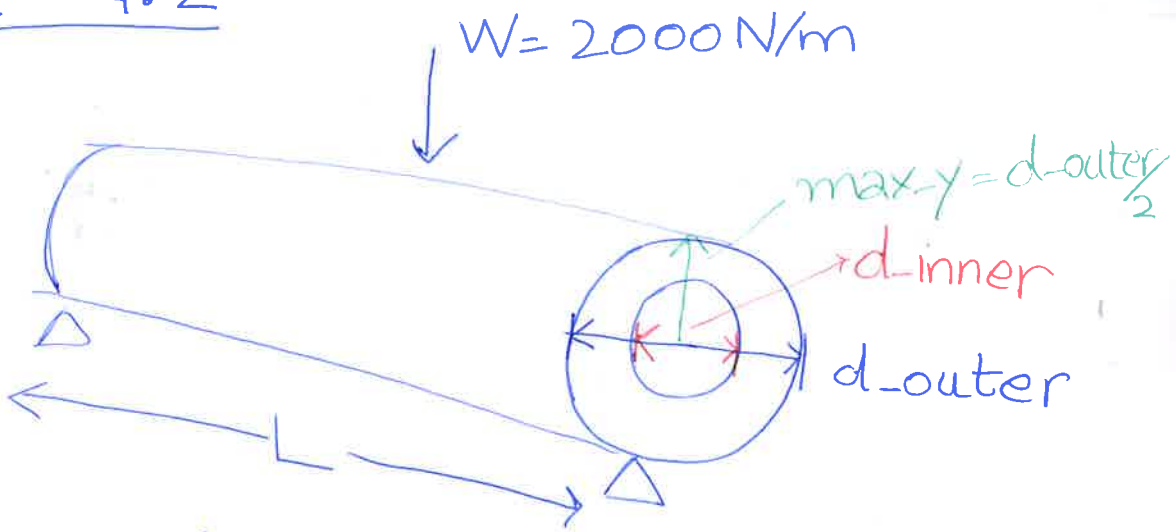
Exercise 4.2



$$I_{tube} = \frac{\pi \left(d\_outer^4 - d\_inner^4 \right)}{64}$$

L=20m

d_outer = 100.0 mm

d_inner = 90.0 mm

M for hollow tube = $WL^2/8$

convert M from Nm to Nmm

$WL^2/8 \times 1.0e^3$

$$\sigma = \frac{M \times y\_max}{I_{tube}}$$