

1) zie antwoordblad

2) Max moment = 40 kNm

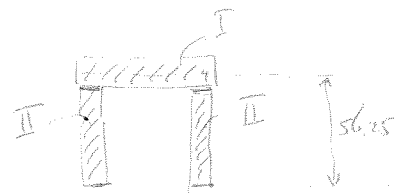
Max $y = 62,5$ mm

$$I = \frac{1}{12}bh^3 - \frac{1}{12}bh^3 = \frac{1}{12} \cdot 100 \cdot 125^3 - \frac{1}{12} \cdot 75 \cdot 100^3 = 1,0 \cdot 10^7 \text{ mm}^4$$

$$\sigma^{\max} = \frac{40000 \cdot 0,0625}{1,0 \cdot 10^{-5}} = 249,3 \text{ MPa}$$

3) Max dwarskracht = 30 kN

Max Q



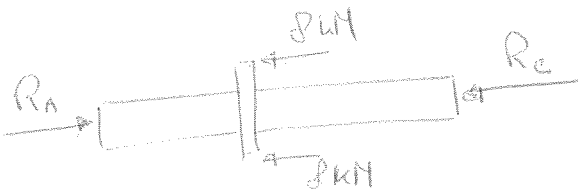
$$Q_I = 100 \cdot 12,5 \cdot 56,25 =$$

$$Q_{II} = 50 \cdot 12,5 \cdot 25 = \frac{\quad \times 2}{1,016 \cdot 10^{-4}} +$$

$$l = 2 \times 0,0125 = 0,025$$

$$\tau^{\max} = \frac{30000 \cdot 1,016 \cdot 10^{-4}}{1,0 \cdot 10^{-5} \cdot 0,025} = 12,16 \text{ MPa}$$

4)



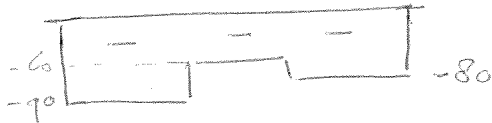
$$\sum F_x \rightarrow r: 0 = R_A - 16 - R_C \Rightarrow R_C = R_A - 16$$

compatibiliteit. $\Delta l = 0 = \Delta l_{AB} + \Delta l_{BC}$

$$0 = \frac{-R_A \cdot L_{AB}}{E \cdot A} + \frac{-(R_A - 16) \cdot L_{BC}}{E \cdot A}$$

$$0 = -R_A \cdot 0,3 + -R_A \cdot 0,7 + 16 \cdot 0,7 \Rightarrow R_A = 11,2 \text{ kN}$$
$$R_C = -4,8 \text{ kN}$$

5) $T = 1 \bar{q} n$



$$T_{\max} = -90 \text{ Nm}$$

$$c_{\max} = 0,04 / 2 = 0,02 \text{ m}$$

$$\begin{aligned} I_P &= \frac{\pi}{2} (r_{\text{au\ss}}^4 - r_{\text{inn}}^4) \\ &= \frac{\pi}{2} (0,02^4 - 0,0185^4) = 6,7 \cdot 10^{-8} \end{aligned}$$

$$\tau_{\max} = \frac{T \cdot c}{I_P} = \frac{90 \cdot 0,02}{6,7 \cdot 10^{-8}} = 26,7 \text{ MPa}$$