

$$1. \quad R_m = \frac{F}{A}$$

$$F = R_m \cdot A = 230 \cdot 300 \cdot 100 = 6900000 \text{ N} = \underline{\underline{6.90 \text{ MN}}}$$

$$2. a) \quad \varepsilon = \frac{\delta}{l_0}$$

$$\delta = \varepsilon l_0 = 0.0004 \cdot 2.000 = 0.0008 \text{ m} = \underline{\underline{0.8 \text{ mm}}}$$

$$b) \quad \underline{\underline{2.000 \text{ m}}}$$

$$c) \quad \underline{\underline{\text{längre}}}$$

$$3. \quad \varepsilon = \frac{\delta}{l_0}, \quad \sigma = \frac{F}{A}, \quad \sigma = E\varepsilon$$

$$F = \sigma A = E\varepsilon A = E \frac{\delta}{l_0} A = 0,3 \cdot \frac{10}{20} \cdot 2 \cdot 4 = 1,2 \text{ N}$$

$$m = \frac{F}{g} = \frac{1,2}{9,82} = \underline{\underline{0,122 \text{ kg}}}$$

$$4. \quad \gamma = \frac{F}{A}; \quad A = 110 \times \text{mm}^2$$

$$A = \frac{F}{\gamma}$$

$$110 \times = \frac{F}{\gamma}$$

$$x = \frac{F}{110\gamma} = \frac{60000}{110 \cdot 5} = \underline{\underline{109,1 \text{ mm}}}$$

$$5. \quad R_e = n_s \sigma_{\max}; \quad \sigma_{\max} = \frac{F}{A}; \quad A = \frac{\pi d^2}{4}$$

$$A = \frac{\pi d^2}{4} = \frac{n_s F}{R_e}$$

$$F = 5 \cdot 80 \cdot 9,82 = 3928 \text{ N}$$

$$d = \sqrt{\frac{4 n_s F}{\pi R_e}} = \sqrt{\frac{4 \cdot 5 \cdot 3928}{\pi \cdot 450}} = \underline{\underline{10,5 \text{ mm}}}$$

$$6. \quad A = \frac{\pi d_j^2}{4} - \frac{\pi d_i^2}{4} = \frac{\pi}{4} (d_j^2 - d_i^2)$$

$$R_m = \frac{F}{A} = \frac{6,7 \cdot 10^3 \cdot 9,82}{\frac{\pi}{4} (1550^2 - 1370^2)} = \underline{\underline{0,159 \text{ N/mm}^2}}$$

$$7. \quad \epsilon = \frac{\delta}{l_0}; \quad \sigma = E\epsilon; \quad \sigma = \frac{F}{A}$$

$$\frac{F}{A} = E\epsilon$$

$$F = EA = 30 \cdot 10^3 \cdot \frac{4}{470} \cdot 340 \cdot 510 = 44272340 \text{ N} = \underline{\underline{44.3 \text{ MN}}}$$

$$8. \quad R_m = n_s \sigma_{\max}; \quad \sigma_{\max} = \frac{F}{A}$$

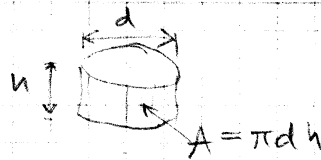
$$A = n \cdot \frac{\pi d^2}{4}$$

$$R_m = \frac{4 n_s F}{n \pi d^2}$$

$$n = \frac{4 n_s F}{\pi d^2 R_m} = \frac{4 \cdot 12 \cdot 10 \cdot 9.82}{\pi \cdot 0.5^2 \cdot 4} = \underline{\underline{1500 \text{ st trådar}}}$$

$$9. \quad \tau = \frac{F}{A}$$

$$A = \pi d h$$



$$F = \tau_{Fe} \pi d_{Fe} h = \tau_{Al} \pi d_{Al} h$$

$$\tau_{Fe} d_{Fe} = \tau_{Al} d_{Al}$$

$$d_{Al} = \frac{\tau_{Fe} d_{Fe}}{\tau_{Al}} = \frac{650 \cdot 7}{275} = \underline{\underline{16.5 \text{ mm}}}$$