

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

$$F = R_m A = 240 \cdot 300 \cdot 100 = 7200000 \text{ N} = \underline{\underline{7.2 \text{ MN}}}$$

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

$$\delta = \varepsilon l_0 = 0.0003 \cdot 2.000 = 0.0006 \text{ m} = \underline{\underline{0.6 \text{ mm}}}$$

$$b) \quad l_0 = \underline{\underline{2.000 \text{ m}}}$$

c) längre

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

$$F = \sigma A = E\varepsilon A = E \cdot \frac{\delta}{l_0} \cdot A = 0.3 \cdot \frac{10}{20} \cdot 2 \cdot 5 = 1.5 \text{ N}$$

$$1 \text{ kg} : \frac{1.5}{9.82} = \underline{\underline{0.15 \text{ kg}}}$$

4.

$$\tau = \frac{F}{A} \quad A = 110 \cdot x \text{ mm}^2$$

$$\tau A = F$$

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

$$110x = \frac{F}{\tau}$$

$$x = \frac{F}{110\tau} = \frac{60000}{110 \cdot 6} = \underline{\underline{91 \text{ mm}}}$$

5.

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

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

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

$$d = \sqrt{\frac{4n_s F}{\pi R_e}} = \sqrt{\frac{4 \cdot 10 \cdot 3928}{\pi \cdot 460}} = \underline{\underline{10.5 \text{ mm}}}$$

$$F = 5.80 \cdot 9.82 = 3928 \text{ N}$$

$$6. \quad R_m = \frac{F}{A} = \frac{7.2 \cdot 10^3 \cdot 9.82}{412805} = \underline{\underline{0.171 \text{ N/mm}^2}}$$

TEQA

$$A = \frac{\pi d_y^2}{4} - \frac{\pi d_i^2}{4} = \frac{\pi}{4} (d_y^2 - d_i^2) = \frac{\pi}{4} (1550^2 - 1370^2) = 412805 \text{ mm}^2$$

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

$$A = 340 \cdot 510 \text{ mm}^2 = \underline{\underline{173400 \text{ mm}^2}}$$

$$F = 30 \cdot 10^3 \cdot \frac{4}{480} \cdot 173400 = 43350000 = \underline{\underline{43.4 \text{ MN}}}$$

$$8. \quad R_m = n_s \sigma_{\max} = \frac{n_s F}{A} = \frac{4 n_s F}{n \pi d^2}$$

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

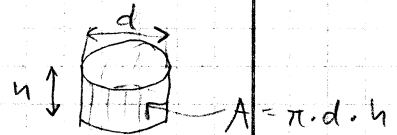
$$n = \frac{4 n_s F}{\pi d^2 R_m} = \frac{4 \cdot 12 \cdot 11 \cdot 9.82}{\pi (0.5)^2 \cdot 4} = \underline{\underline{1650 \text{ st. trådar}}}$$

$$9. \quad \tau_{Fe} = \frac{F}{\pi \cdot d_{Fe} \cdot h}$$

$$\tau_{Al} = \frac{F}{\pi \cdot d_{Al} \cdot h}$$

$$d_{Fe} = 8 \text{ mm}$$

$$A_{Fe} = \pi \cdot d_{Fe} \cdot h$$



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

$$d_{Al} = \frac{d_{Fe} \cdot \tau_{Fe}}{\tau_{Al}} = \frac{8 \cdot 725}{275} = \underline{\underline{21.1 \text{ mm}}}$$