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Oppg 1) $\sigma = E \epsilon$

$$E = \frac{\sigma}{\epsilon} = \frac{\frac{F}{A_0}}{\frac{\Delta l}{l_0}} = \frac{F l_0}{A_0 \Delta l}$$

$$\underline{\underline{E = 71,2 \text{ GPa}}}$$

Oppg 2a)

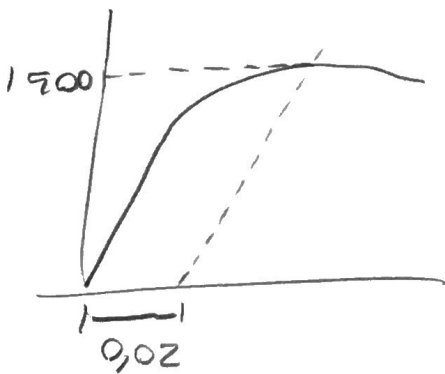
$$\underline{\underline{E = \frac{\sigma}{\epsilon} \approx \frac{1400 \text{ MPa}}{0,0075} = 186 \text{ GPa}}}$$

2b)

Proportionalitetsgrense: $\epsilon \approx 0,0075$

2c)

Fra figuren: Flytegrense ved offset 0,02 er ca. 1500 MPa



2d) Streckfasthet er ca 1950 MPa

Oppg 3) $\begin{cases} l = 100 \text{ mm}, F = 100 \text{ kN} \\ \Delta l = 5 \text{ mm} \end{cases}$

$\rightarrow \epsilon = 0,05 \xrightarrow[\text{Fra Figur}]{} \sigma \approx 250 \text{ MPa}$

$$\sigma = \frac{F}{A_0} \rightarrow A_0 = 4 \cdot 10^{-4} \text{ m}^2$$

$$= 4 \text{ cm}^2$$

Oppg 4b) (4a, se vedlegg)

$$E = \frac{\sigma}{\epsilon} \approx 58,5 \text{ GPa}$$

4c) Flytegrensen er ca. 300 MPa fra figuren

4d) Strekkfastheten er ca. 369 MPa fra
Point(max(sigma))

4e) Duktiliteten i %EL er 16,5 %
Se vedlagt kode

4f) $U_r = \frac{1}{2} \sigma_r \epsilon_r \approx \frac{1}{2} 300 \text{ MPa} \cdot 0,026$

$U_r \approx 3,9 \text{ MPa}$ fra figuren