

Remarks: See §2.2 pages 18 till 24

Answers:

a. $\varepsilon = 0,48 \text{ ‰}$ (equal for all bars)

$$\sigma^{(1)} = \sigma^{(3)} = 60 \text{ N/mm}^2$$

$$\sigma^{(2)} = 96 \text{ N/mm}^2$$

b. $N^{(1)} = N^{(3)} = 15 \text{ kN}$

$$N^{(2)} = 24 \text{ kN}$$

c. $G = 54 \text{ kN}$

Explanation:

$$\text{a. } \varepsilon = \frac{0,96 \text{ mm}}{2000 \text{ mm}} = 0,48 \times 10^{-3}$$

$$\sigma^{(1)} = \sigma^{(3)} = (0,48 \times 10^{-3}) \times (125 \times 10^3 \text{ N/mm}^2) = 60 \text{ N/mm}^2$$

$$\sigma^{(2)} = (0,48 \times 10^{-3}) \times (200 \times 10^3 \text{ N/mm}^2) = 96 \text{ N/mm}^2$$

$$\text{b. } N^{(1)} = N^{(3)} = (60 \text{ N/mm}^2)(250 \text{ mm}^2) = 15 \text{ kN}$$

$$N^{(2)} = (96 \text{ N/mm}^2)(250 \text{ mm}^2) = 24 \text{ kN}$$

$$\text{c. } G = N^{(1)} + N^{(2)} + N^{(3)}$$