Remarks: See §2.3, pages 24 till 26
See §2.6, pages 34 onwards

Answers 2.27-1:

a. $N^{(1)} = +40$ kN $N^{(2)} = +15$ kN $N^{(3)} = +30$ kN
b. $\varepsilon^{(1)} = 0{,}833$ ‰ $\varepsilon^{(2)} = 0{,}313$ ‰ $\varepsilon^{(3)} = 0{,}625$ ‰
c. $u_{x;\mathrm{B}} = +3{,}0$ mm

Answers 2.27-2:

a. $N^{(1)} = +5$ kN $N^{(2)} = -20$ kN $N^{(3)} = +25$ kN
b. $\varepsilon^{(1)} = 0{,}104$ ‰ $\varepsilon^{(2)} = -0{,}417$ ‰ $\varepsilon^{(3)} = 0{,}521$ ‰
c. $u_{x;\mathrm{B}} = 0$

Answers 2.27-3:

a. $N^{(1)} = -32$ kN $N^{(2)} = -48$ kN $N^{(3)} = +12$ kN
b. $\varepsilon^{(1)} = -0{,}667$ ‰ $\varepsilon^{(2)} = -1{,}000$ ‰ $\varepsilon^{(3)} = 0{,}250$ ‰
c. $u_{x;\mathrm{B}} = -3$ mm

Explanation 2.27-1 till 3:

The three sections are numbered from the left (1) to (3).

$EA = 48 \times 10^3$ kN

$$u_{x;\mathrm{B}} = \sum_{i=1}^{3} \varepsilon^{(i)} \ell^{(i)} = \sum_{i=1}^{3} \frac{N^{(i)} \ell^{(i)}}{EA}$$

$u_{x;\mathrm{B}}$ is also obtained from the area under the ε-diagram of question b.