

Remarks: See §2.2.1, pages 19 till 21
See §2.3, pages 24 till 26
See §2.6, pages 34 onwards

Answers :

$$\begin{aligned}\Delta \ell^{(1)} &= +2 \text{ mm} \\ \Delta \ell^{(2)} &= -1 \text{ mm} \\ \Delta \ell^{(3)} &= +1 \text{ mm} \\ \Delta \ell^{(4)} &= -1 \text{ mm} \\ \Delta \ell^{(5)} &= -4 \text{ mm} \\ \Delta \ell^{(6)} &= -3 \text{ mm} \\ \Delta \ell^{(7)} &= +2 \text{ mm}\end{aligned}$$

Explanation:

$$\begin{aligned}N^{(1)} &= +70\sqrt{2} \text{ kN} \\ N^{(2)} &= -70 \text{ kN} \\ N^{(3)} &= +70 \text{ kN} \\ N^{(4)} &= -70 \text{ kN} \\ N^{(5)} &= -140\sqrt{2} \text{ kN} \\ N^{(6)} &= -210 \text{ kN} \\ N^{(7)} &= +140 \text{ kN}\end{aligned}$$