

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

Answer:

The roller is displaced 3mm to the right

Explanation:

$$N^{AB} = +75 \text{ kN}$$

$$\Delta \ell^{AB} = \frac{(+75 \times 10^3 \text{ N})(6 \times 10^3 \text{ mm})}{150 \times 10^6 \text{ N}} = +3 \text{ mm}$$