Remarks: See §4.4, pages 168 till 170

See §4.5, pages 171 till 184

Hint:

Draw the shear force diagram and the moment diagram

Answers:

a. In the section 3 meters right of the left support

b. $\sigma_b = +100,4$ N/mm^2

$\sigma_t = -100,4$ N/mm^2

Explanation:

Support reactions: 37 kN ($\uparrow$) left-side and 148 kN ($\uparrow$) right-side.

Moment extremes are where the shear force is zero or where the sign changes.

- Maximum span moment: $M = 92,5$ kNm ($\smile$); this is 3 meters right from the left support, where $V_z = 0$

- Support point moment: $M = 74$ kNm ($\frown$)

The span moment is greater, therefore:

$$\sigma_{\max}^{(M)} = \frac{(92,5 \times 10^6 \text{ Nmm})(180 \text{ mm})}{165,888 \times 10^6 \text{ mm}^4} = 100,4 \text{ N/mm}^2$$