

Remarks: See § 2.3, page 24 till 26

Hint:

First calculate all the forces in the truss members

Answers:

a.  $\sigma^{(2)} = \sigma^{(6)} = -125 \text{ N/mm}^2$   
 $\sigma^{(12)} = \sigma^{(16)} = -75 \text{ N/mm}^2$

b.  $\sigma^{(4)} = \sigma^{(14)} = 0$   
 $\sigma^{(8)} = \sigma^{(10)} = +150 \text{ N/mm}^2$

c.  $\sigma^{(1)} = -125 \text{ N/mm}^2$   
 $\sigma^{(5)} = \sigma^{(13)} = 0$   
 $\sigma^{(9)} = +100 \text{ N/mm}^2$   
 $\sigma^{(17)} = -75 \text{ N/mm}^2$

d.  $\sigma^{(3)} = +101 \text{ N/mm}^2$   
 $\sigma^{(7)} = -20,2 \text{ N/mm}^2$   
 $\sigma^{(11)} = -60,6 \text{ N/mm}^2$   
 $\sigma^{(15)} = +60,6 \text{ N/mm}^2$

Explanation:

The members (4), (5), (13) and (14) are zero force members.

Forces in the truss members:

$$\begin{aligned} N^{(1)} &= -100 \text{ kN} \\ N^{(2)} &= -100 \text{ kN} \\ N^{(3)} &= +100\sqrt{2} \text{ kN} \\ N^{(6)} &= -100 \text{ kN} \\ N^{(7)} &= -20\sqrt{2} \text{ kN} \\ N^{(8)} &= +120 \text{ kN} \\ N^{(9)} &= +80 \text{ kN} \\ N^{(10)} &= +120 \text{ kN} \\ N^{(11)} &= -60\sqrt{2} \text{ kN} \\ N^{(12)} &= -60 \text{ kN} \\ N^{(15)} &= +60\sqrt{2} \text{ kN} \\ N^{(16)} &= -60 \text{ kN} \\ N^{(17)} &= -60 \text{ kN} \end{aligned}$$