

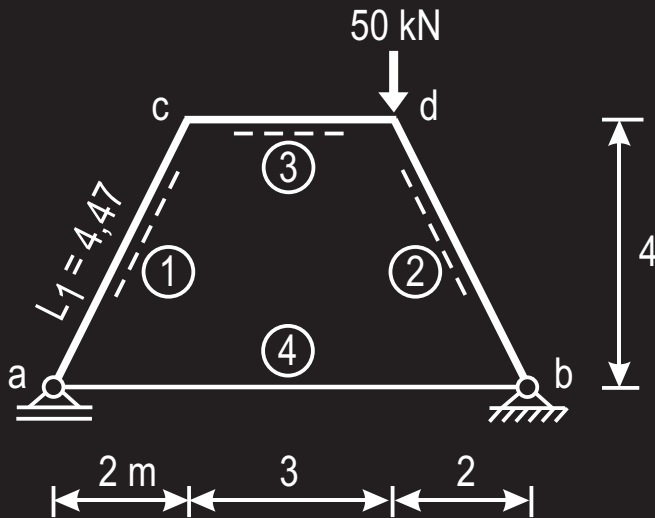
**Diethard Thieme**

**Übungen**

**zur**

**Baustatik**

**BS 06**



Kennwerte

$$J_1 = J_2 = 200\,000 \text{ cm}^4$$

$$J_3 = 1,2 J_2$$

$$E_1 = E_2 = E_3 = 2,1 \cdot 10^7 \text{ kN/m}^2$$

$$A_4 = 4 \text{ cm}^2$$

$$E_4 = 2,1 \cdot 10^8 \text{ kN/m}^2$$

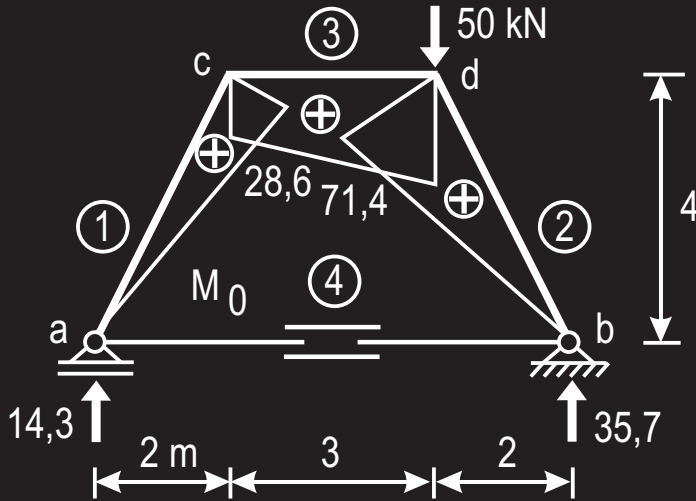
$$\text{Gewählt: } J_0 = J_1 ; E_0 = E_1$$

Reduzierte Stablängen

$$L'_1 = L'_2 = 4,47 \text{ m}$$

$$L'_3 = 2,5 \text{ m}$$

$$L''_4 = L_4 \frac{E_0 J_0}{E_4 A_4} = 3,5 \text{ m}^3$$



$$L'_1 = L'_2 = 4,47 ; L'_3 = 2,5 ; L''_4 = 3,5$$

$$a_{10} = 4,47 \frac{1}{3} 28,6 (-4) +$$

$$+ 4,47 \frac{1}{3} 71,4 (-4) +$$

$$+ 2,5 \frac{1}{2} (-4) (28,6 + 71,4) = -1096$$

$$a_{11} = 2 \cdot 4,47 \frac{1}{3} (-4) (-4) +$$

aus N

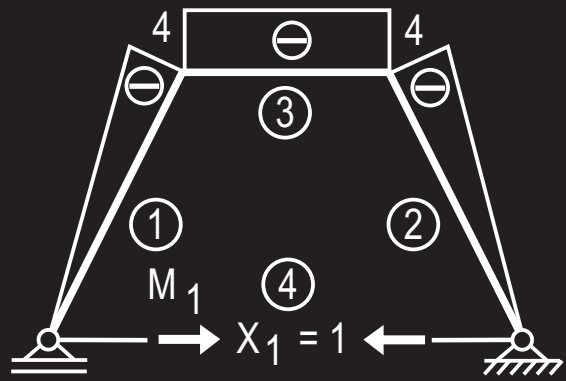
$$+ 2,5 (-4) (-4) + 3,5 \cdot 1 \cdot 1 = 91,1$$

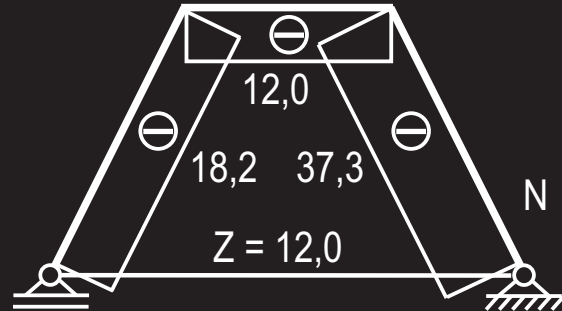
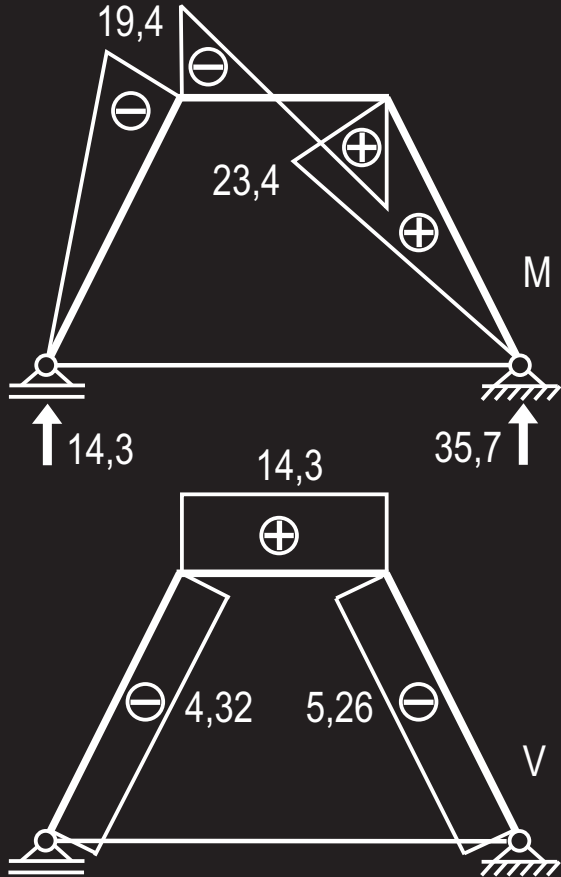
$$a_{11} X_1 = - a_{10} \text{ daraus } X_1 = 12,0$$

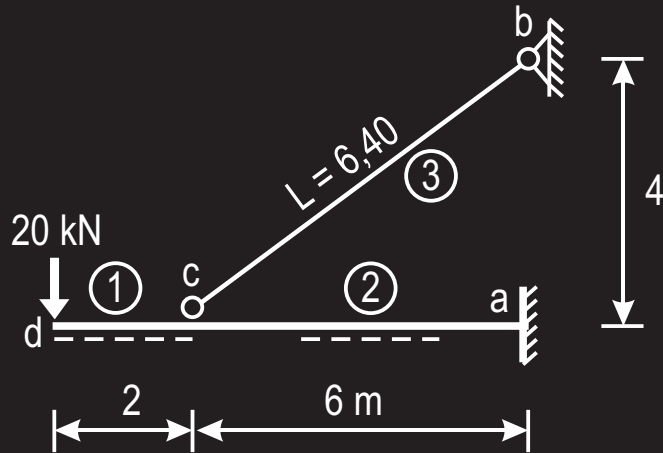
Superposition

$$M_c = 28,6 + 12,0 (-4) = -19,4 \text{ kNm}$$

$$M_d = 71,4 + 12,0 (-4) = 23,4 \text{ kNm}$$







Kennwerte

$$J_1 = J_2 = 300\,000 \text{ cm}^4$$

$$E_1 = E_2 = 2,1 \cdot 10^7 \text{ kN/m}^2$$

$$A_3 = 2 \text{ cm}^2$$

$$E_3 = 2,1 \cdot 10^8 \text{ kN/m}^2$$

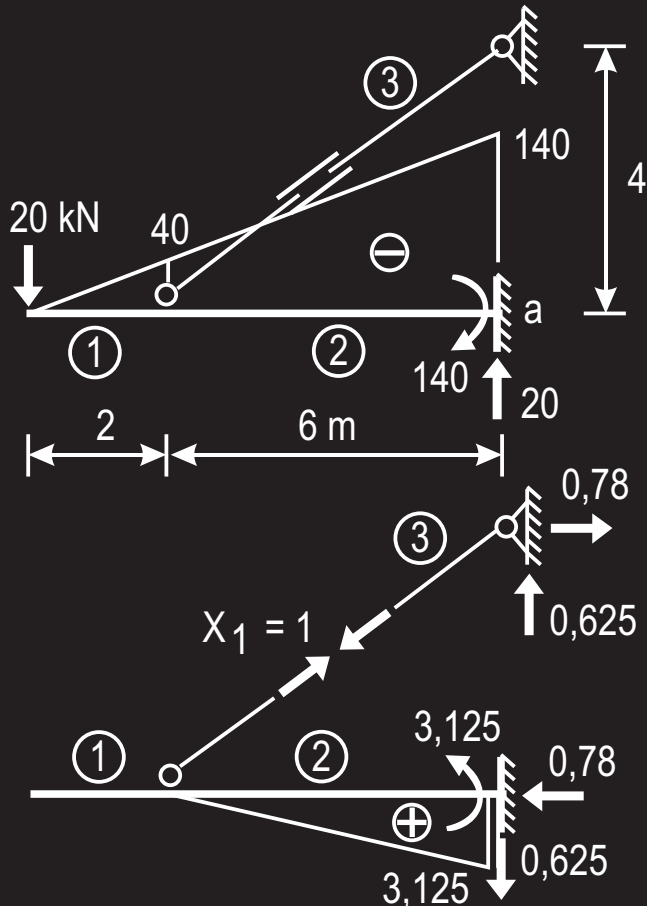
$$\text{Gewählt: } J_0 = J_1 ; E_0 = E_1$$

Reduzierte Stablängen

$$L'_1 = 2 \text{ m}$$

$$L'_2 = 5 \text{ m}$$

$$L''_3 = L_3 \frac{E_0 J_0}{E_3 A_3} = 9,60 \text{ m}^3$$



$$L'_1 = 2 ; L'_2 = 5 ; L''_3 = 9,60$$

$$a = E_0 J_0 1^* \delta$$

Belastungszahl

$$a_{10} = 5 \frac{1}{6} 3,125 (-2 \cdot 140 - 40) = -833,3$$

Vorzahl

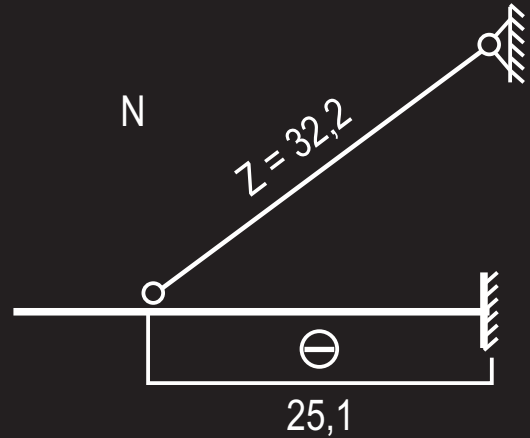
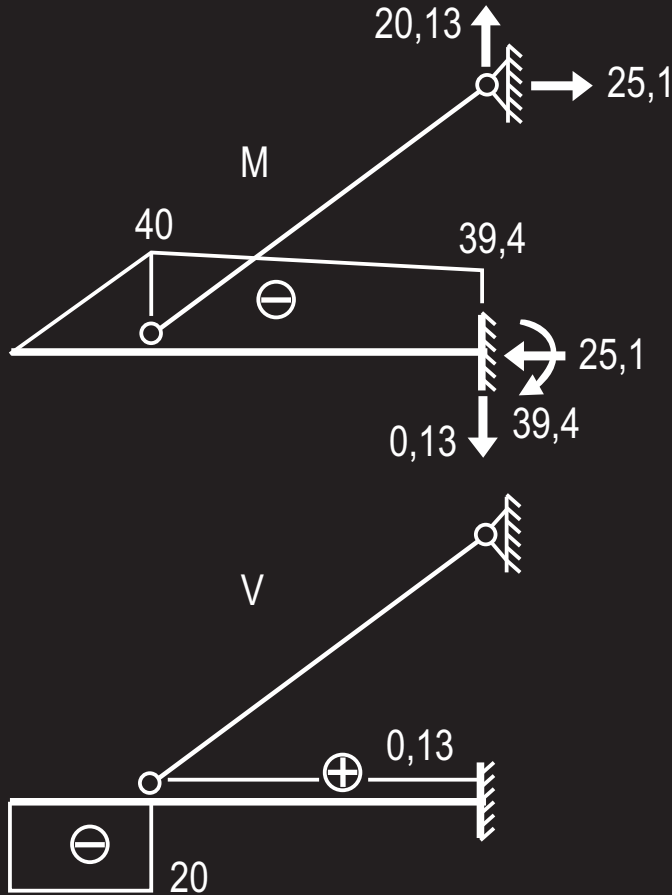
$$a_{11} = 5 \frac{1}{3} 3,125 \cdot 3,125 + \text{aus N} + 9,6 \cdot 1 \cdot 1 = 25,9$$

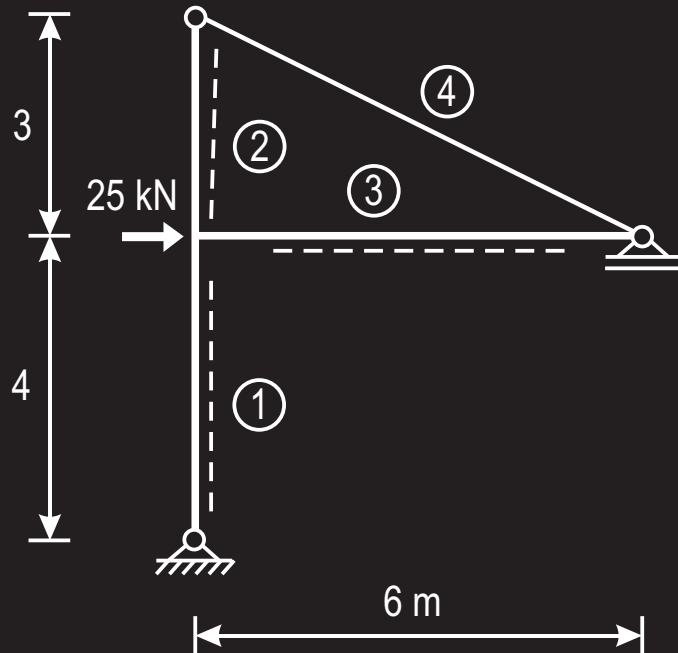
Gleichung

$$a_{11} X_1 = -a_{10} \text{ daraus } X_1 = 32,2$$

Superposition

$$M_a = -140 + 32,2 \cdot 3,125 = -39,4 \text{ kNm}$$





Kennwerte

$$J_1 = J_2 = 120\,000 \text{ cm}^4$$

$$J_3 = 1,5 J_1$$

$$E_1 = E_2 = E_3 = 2,1 \cdot 10^7 \text{ kN/m}^2$$

$$A_4 = 8 \text{ cm}^2$$

$$E_4 = 2,1 \cdot 10^8 \text{ kN/m}^2$$



