

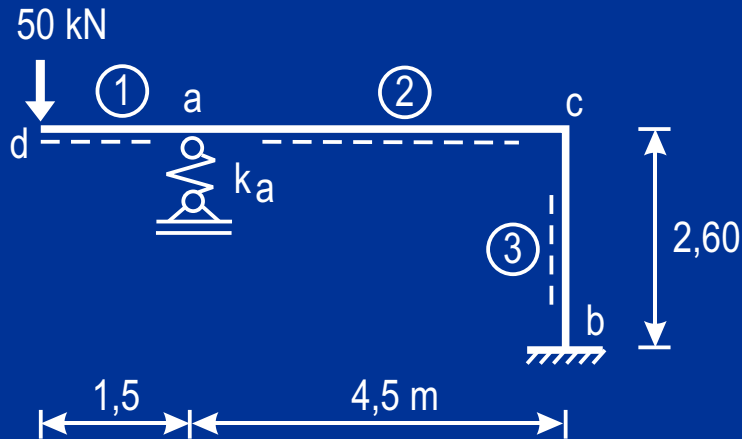
**Diethard Thieme**

**Übungen**

**zur**

**Baustatik**

**BS 07**



### Kennwerte

$$J_1 = J_2 = 1,5 J_3$$

$$J_3 = 240\,000 \text{ cm}^4$$

$$E_1 = E_2 = E_3 = 3 \cdot 10^7 \text{ kN/m}^2$$

$$k_a = 0,14 \text{ mm/kN}$$

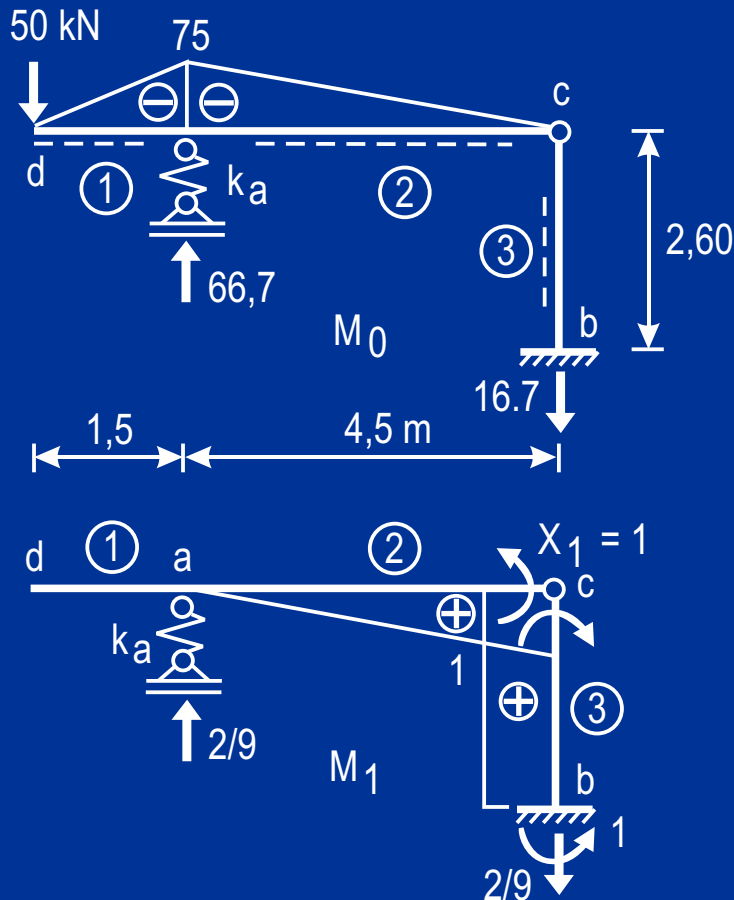
$$\text{Gewählt: } J_0 = J_1 ; E_0 = E_1$$

### Reduzierte Stablängen

$$L'_1 = L_1 \frac{E_0 J_0}{E_1 J_1} = 1,5 \text{ m}$$

$$L'_2 = 4,5 \text{ m} ; L'_3 = 3,9 \text{ m}$$

$$E_0 J_0 k_a = 15,1 \text{ m}^3$$



$$L'_1 = 1,5 ; L'_2 = 4,5 ; L'_3 = 3,9$$

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

Belastungszahl aus  $k_a$

$$a_{10} = 4,5 \frac{1}{6} 1 (-75) + 66,7 \frac{2}{9} 15,1 = 167,6$$

Vorzahl

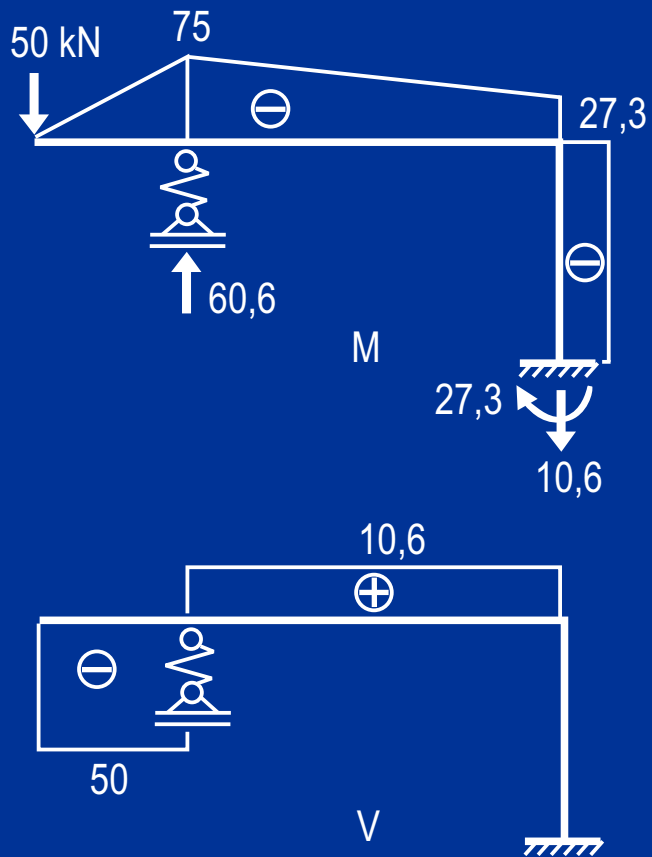
$$a_{11} = 4,5 \frac{1}{3} 1 \cdot 1 + 3,9 \cdot 1 \cdot 1$$

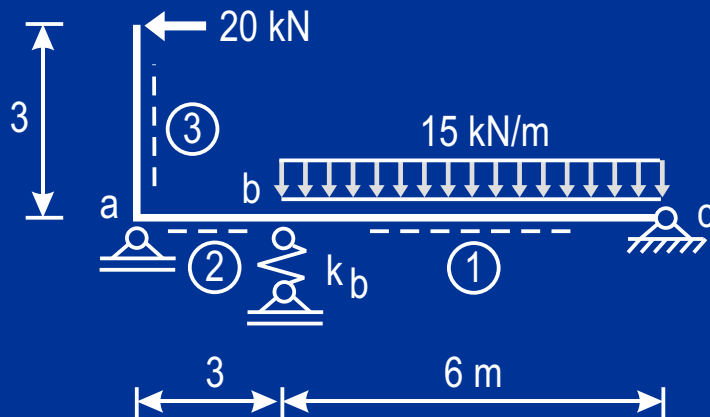
aus  $k_a$

$$+ \frac{2}{9} \frac{2}{9} 15,1 = 6,15$$

Gleichung

$$a_{11} X_1 = -a_{10} \text{ daraus } X_1 = -27,3$$





Kennwerte

$$J_1 = J_2 = 500\,000 \text{ cm}^4$$

$$J_3 = 0,6 J_1$$

$$E_1 = E_2 = E_3 = 3 \cdot 10^7 \text{ kN/m}^2$$

$$k_b = 0,08 \text{ mm/kN}$$

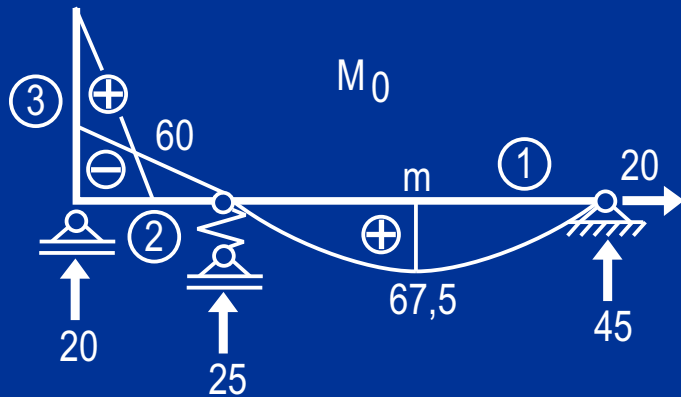
$$\text{Gewählt: } J_0 = J_1 ; E_0 = E_1$$

Reduzierte Stablängen

$$L'_1 = L_1 \frac{E_0 J_0}{E_1 J_1} = 6 \text{ m}$$

$$L'_2 = 3 \text{ m} ; L'_3 = 5 \text{ m}$$

$$E_0 J_0 k_b = 12,0 \text{ m}^3$$



$$L'_1 = 6 ; L'_2 = 3 ; L'_3 = 5$$

$$E_0 J_0 k_b = 12,0 \text{ m}^3$$

$$a_{10} = 3 \frac{1}{6} 1(-60) + 6 \frac{1}{3} 67,5 \cdot 1 - \text{aus } k_b$$

$$- 25 \frac{1}{2} 12,0$$

$$a_{10} = -45 \quad \text{aus } k_b$$

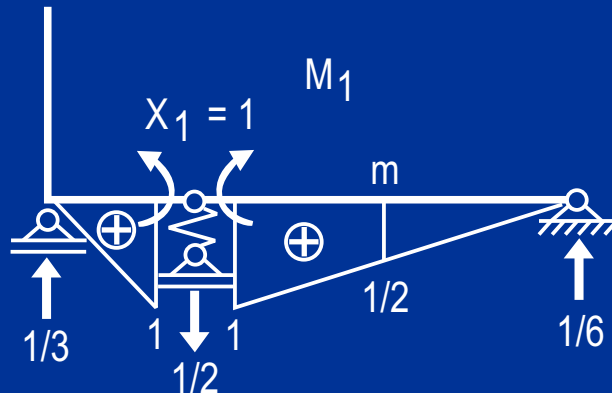
$$a_{11} = 3 \frac{1}{3} 1 \cdot 1 + 6 \frac{1}{3} 1 \cdot 1 + \frac{1}{2} \frac{1}{2} 12,0$$

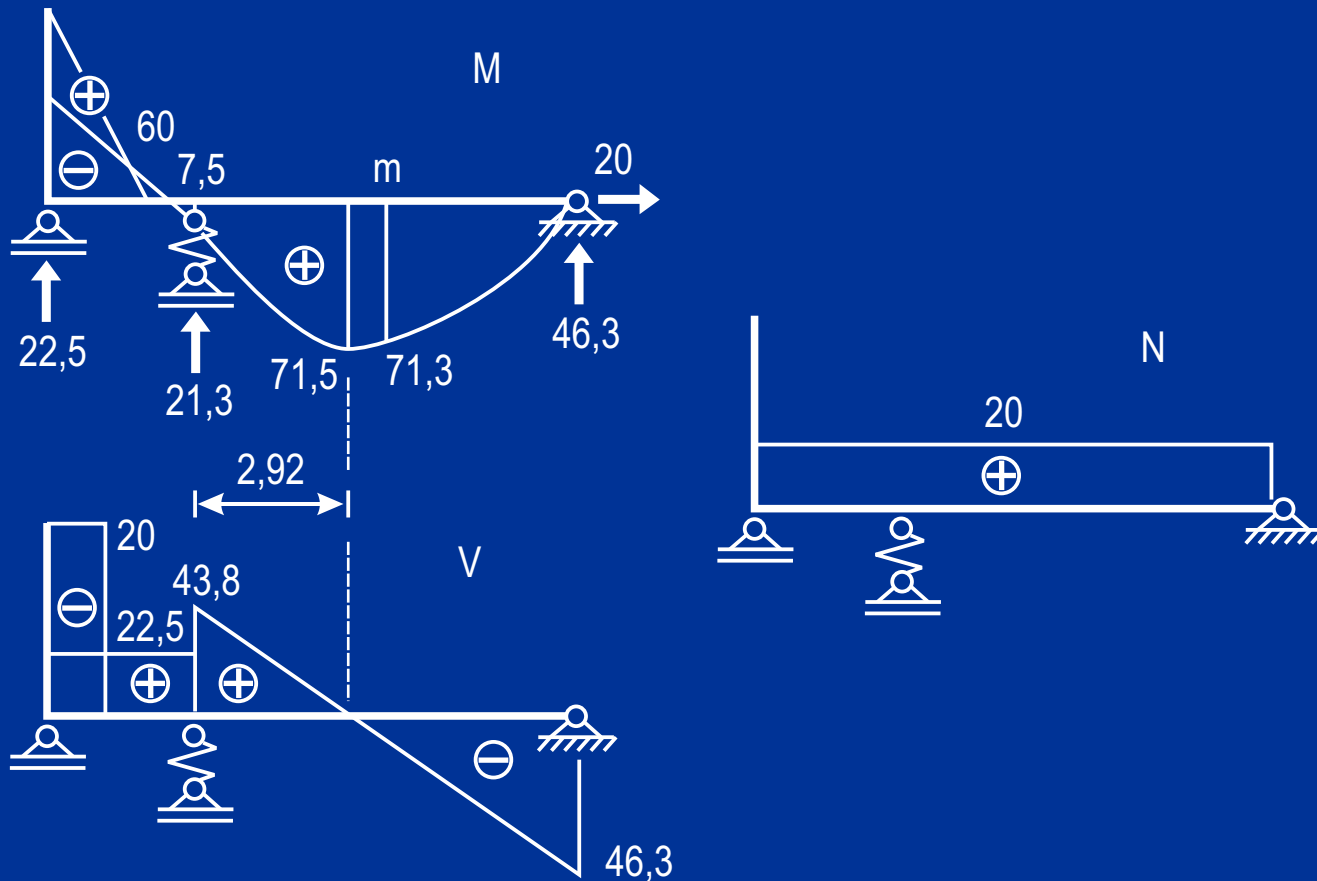
$$a_{11} = 6,0$$

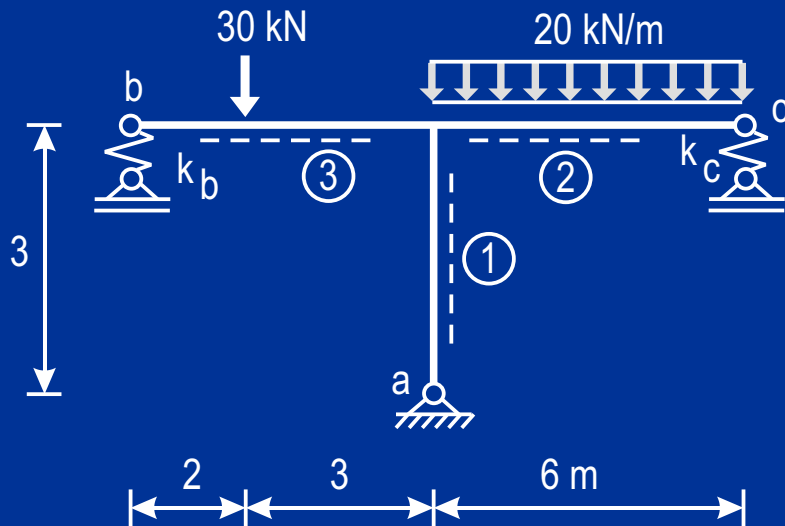
$$a_{11} X_1 = -a_{10} \quad \text{daraus } X_1 = 7,5$$

Superposition

$$M_m = 67,5 + 7,5 \frac{1}{2} = 71,3 \text{ kNm}$$







Kennwerte

$$J_2 = J_3 = 200\,000 \text{ cm}^4$$

$$J_1 = 0,9 J_2$$

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

$$k_b = 3 \text{ mm/kN}$$

$$k_c = 0,6 \text{ mm/kN}$$

