

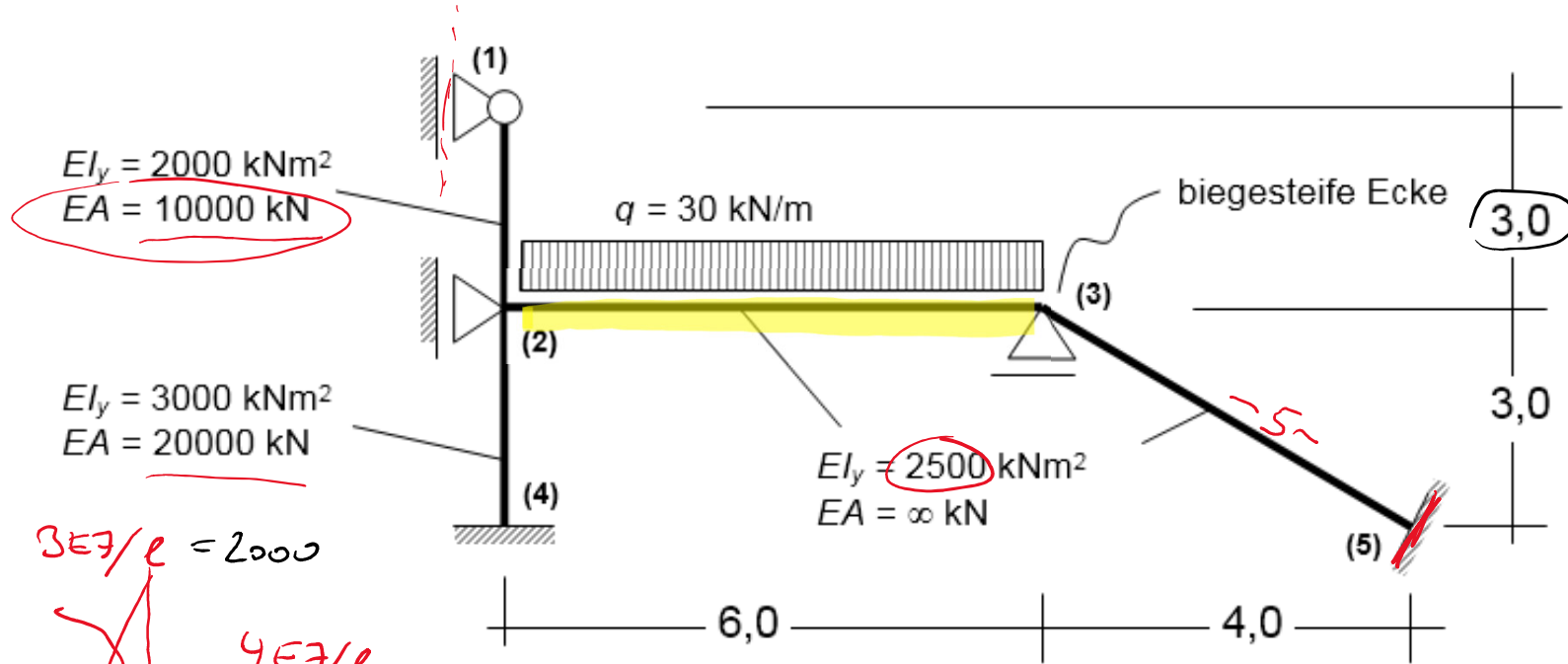
Übungsbeispiele 8: Ersatzfedermodelle

$$C_{ges} = C_1 + C_2$$

$$\frac{3 \cdot 2000}{3} = 2000$$

$$\frac{4 \cdot 3000}{3} = 4000$$

(A)



$$EI_y = 2000 \text{ kNm}^2$$

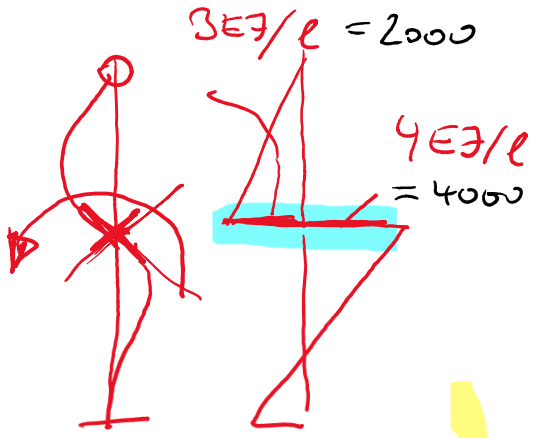
$$EA = 10000 \text{ kN}$$

$$EI_y = 3000 \text{ kNm}^2$$

$$EA = 20000 \text{ kN}$$

$$EI_y = 2500 \text{ kNm}^2$$

$$EA = \infty \text{ kN}$$

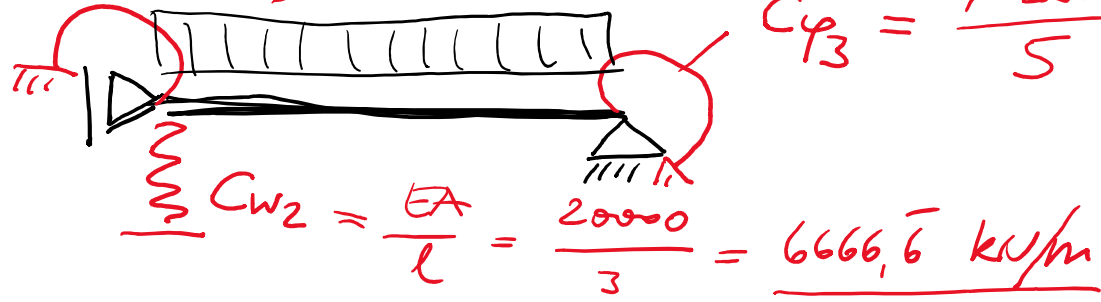


$$3EI/l = 2000$$

$$4EI/l = 4000$$

$$C_{y2} = 6000 \text{ kNm/rad}$$

$$C_{y3} = \frac{4 \cdot 2500}{5} = 2000 \text{ kNm/rad}$$

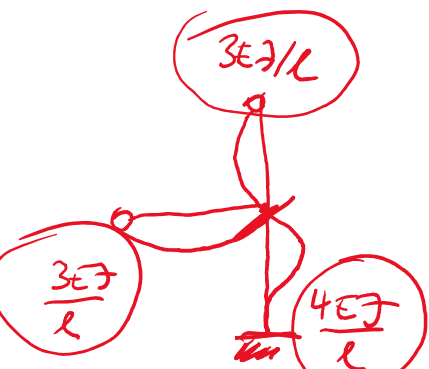
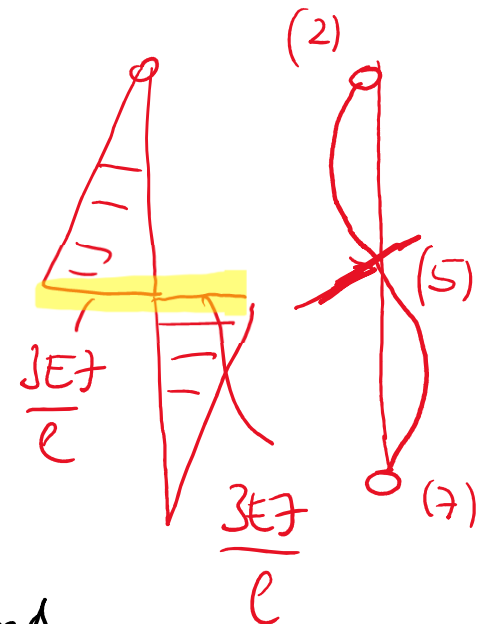
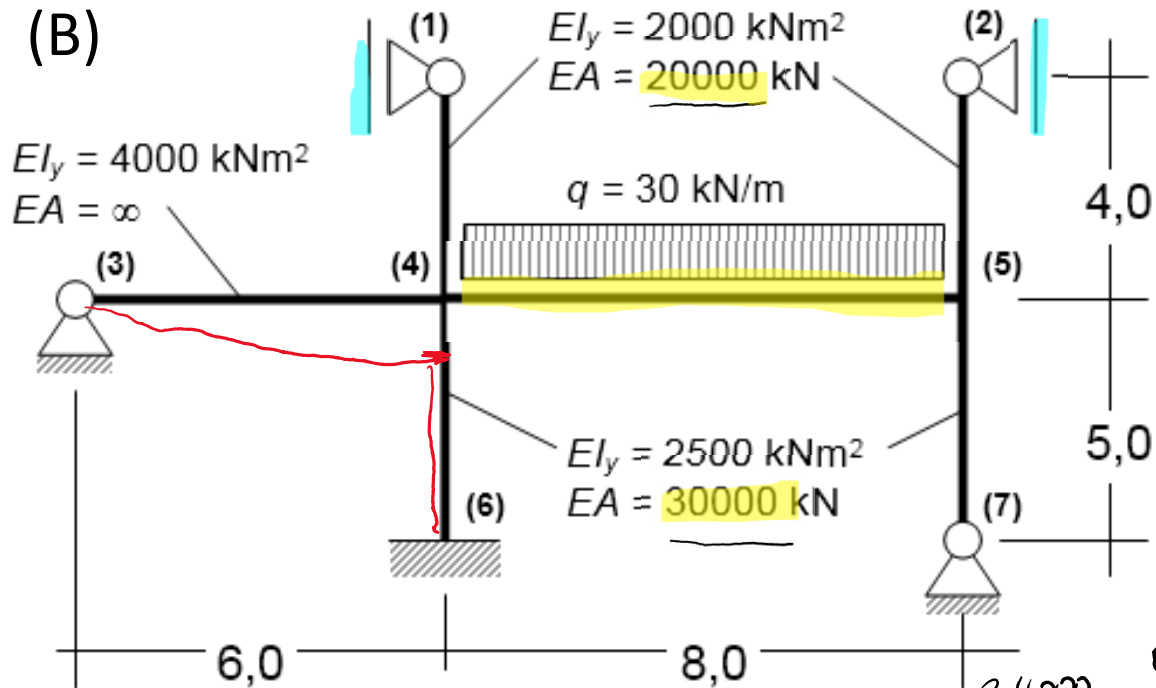


$$C_{w2} = \frac{EA}{l} = \frac{20000}{3} = 6666,6 \text{ kN/m}$$

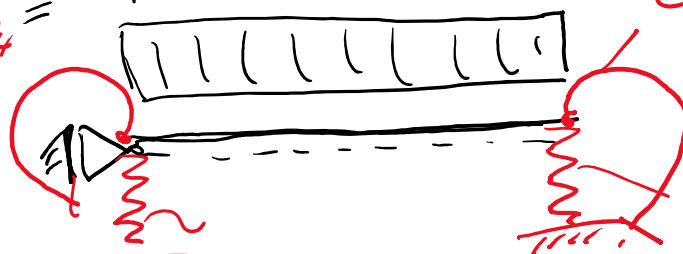
Mo, den 25.05.2020



(B)



$$C_{\varphi 4} = \frac{3 \cdot 2000}{4} + \frac{3 \cdot 4000}{6} + \frac{4 \cdot 2500}{5} = 5500 \text{ kNm/rad}$$

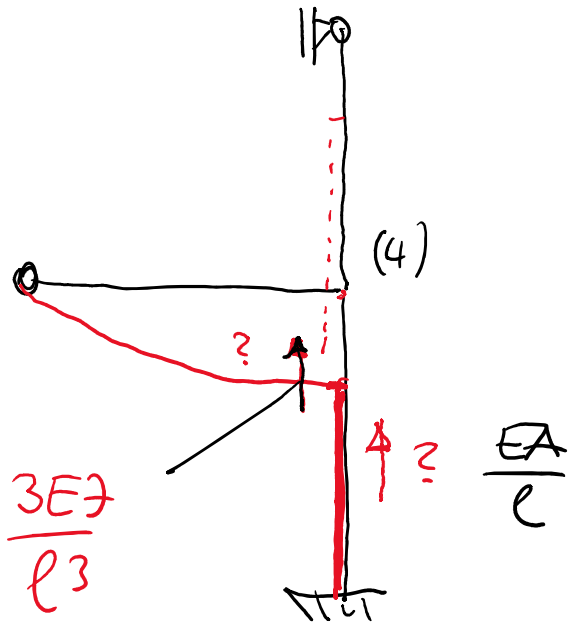


$$C_{\varphi 5} = \frac{3 \cdot 2000}{4} + \frac{3 \cdot 2500}{5} = 1500 + 1500 = 3000 \text{ kNm/rad}$$

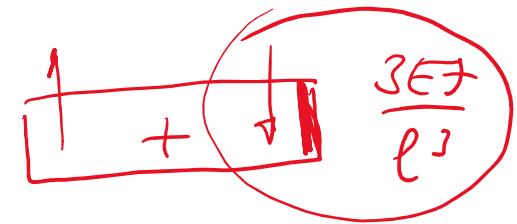
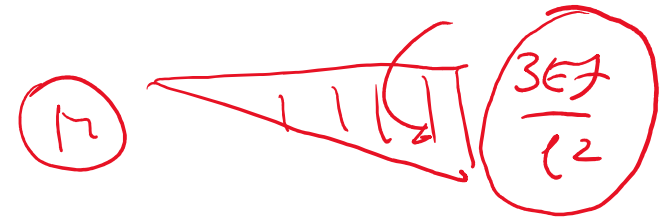
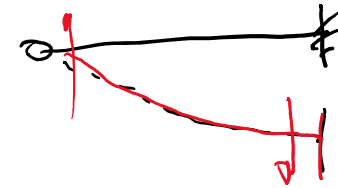
$$C_{w5} = \frac{EA}{L} = \frac{30000}{5} = 6000 \text{ kN/m}$$

$$C_{w4} = \frac{3 \cdot 4000}{63} + \frac{30000}{5} = 6055.5 \text{ kN/m}$$

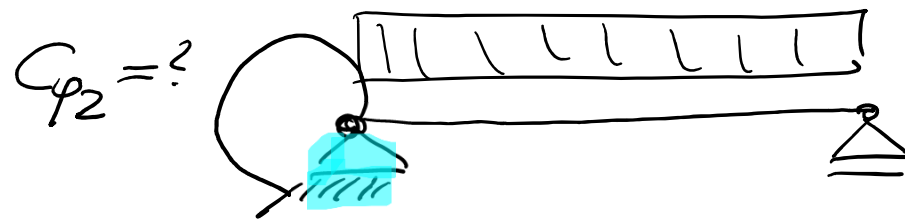
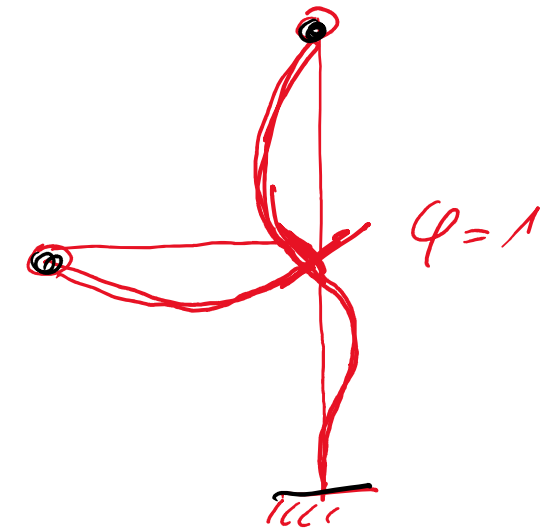
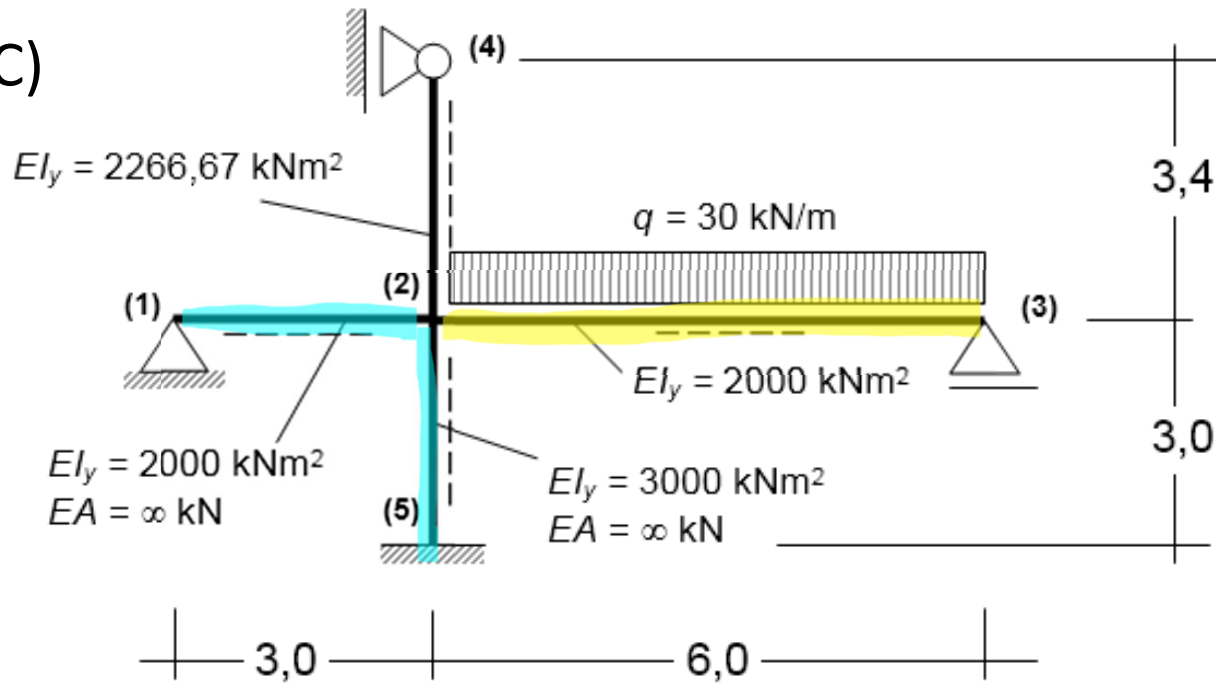
Mo, den 25.05.2020



$$C_{W4} = \frac{3 \cdot EJ}{l^3} + \frac{EA}{e}$$



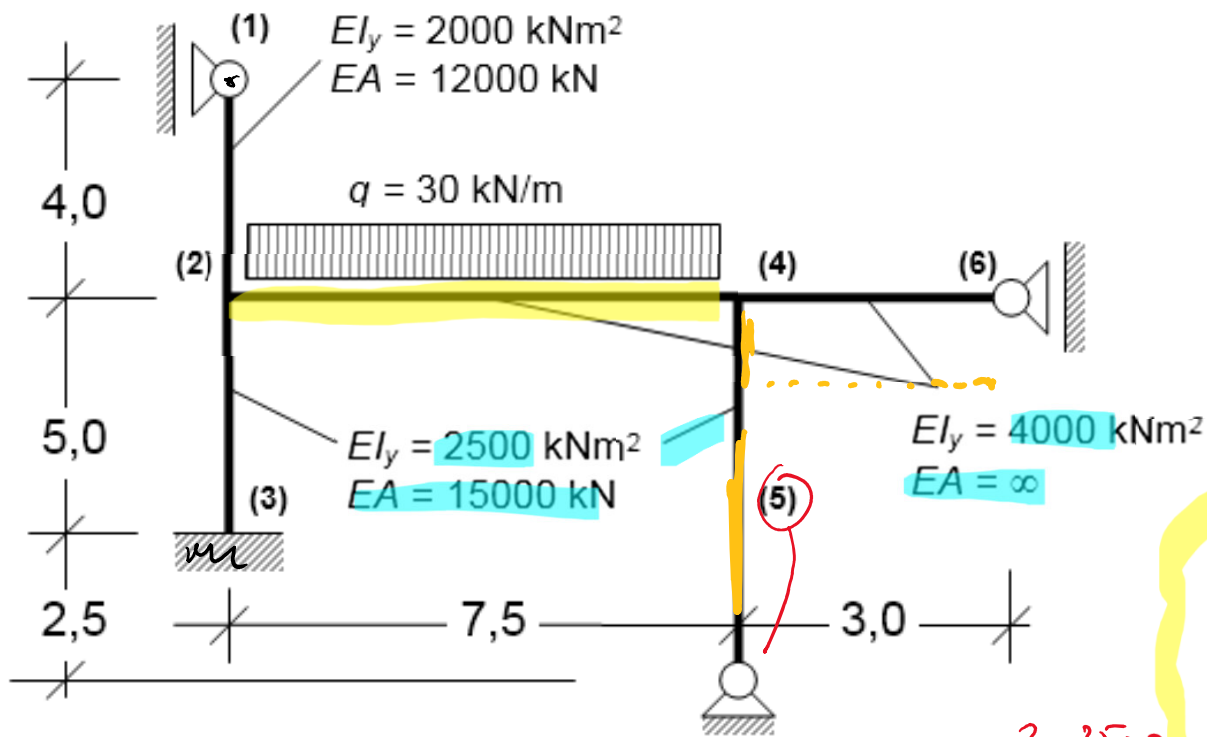
(C)



$$C_{q2} = \frac{3 \cdot 2266,6}{3,4} + \frac{3 \cdot 2000}{3} + \frac{4 \cdot 3000}{3} = \underline{\underline{8000 \text{ kN/m}}}$$

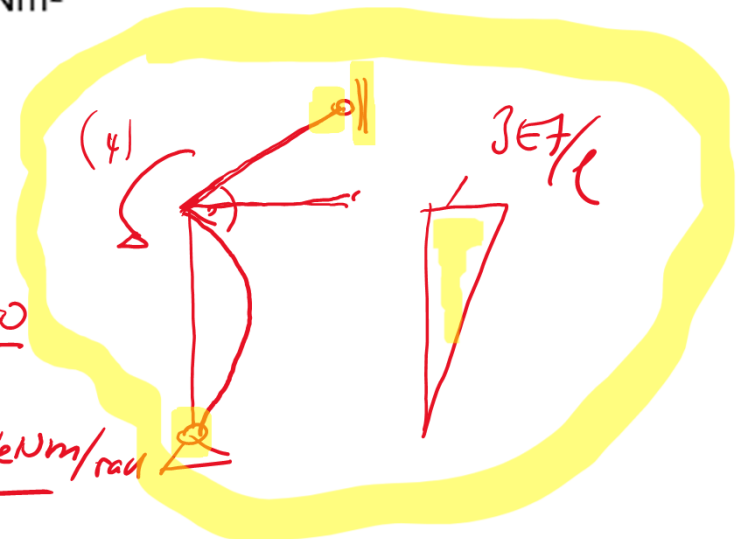
Mo, den 25.05.2020

(D)



$$C_{\varphi 2} = \frac{3 \cdot 2000}{4} + \frac{4 \cdot 2500}{5} = 1500 + 2000 = 3500$$

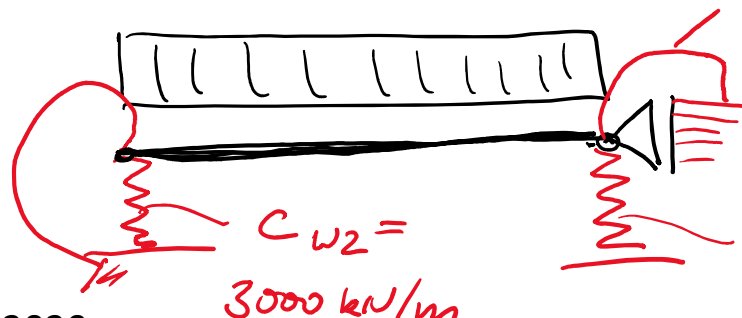
$$C_{w2} = \frac{EA}{l} = \frac{15000}{5} = 3000 \text{ kN/m}$$



$$C_{\varphi 4} = \frac{3 \cdot 2500}{7.5} = 1000 \text{ kNm/rad}$$

$$C_{w4} = \frac{15000}{7.5} = 2000 \text{ kN/m}$$

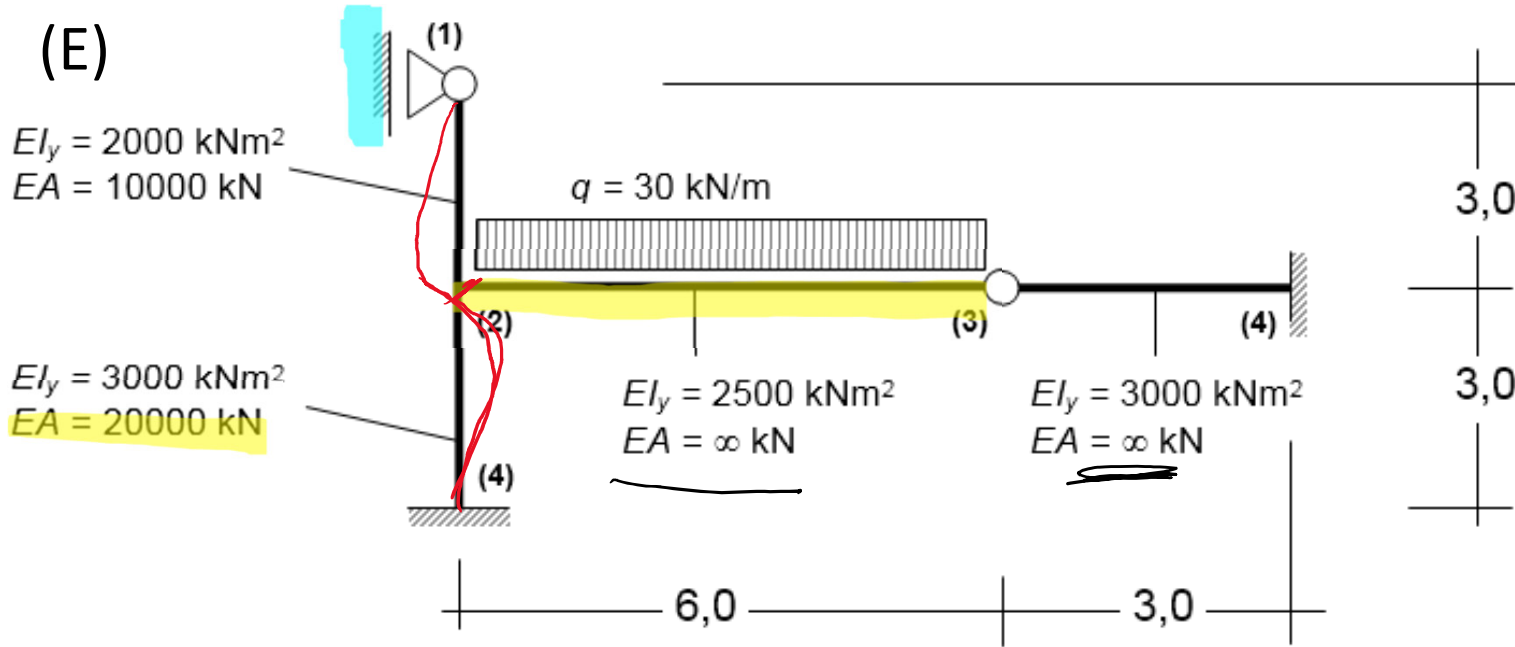
$$3500 = C_{\varphi 2} \text{ kNm/rad}$$



$$C_{w2} = 3000 \text{ kN/m}$$

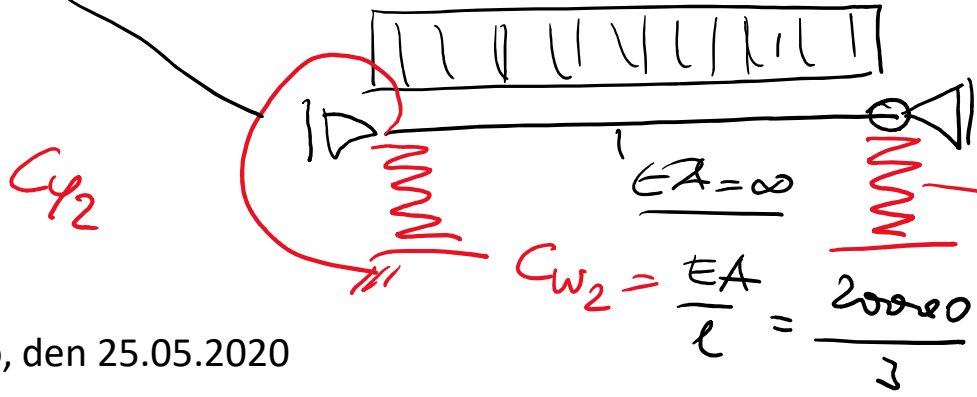
Mo, den 25.05.2020

(E)



$EI_y = 3000 \text{ kNm}^2$
 $EA = 20000 \text{ kN}$

$$C_{\varphi 2} = \frac{3 \cdot 2000}{3} + \frac{4 \cdot 3000}{3} = \underline{6000 \text{ kNm/rad}}$$



$$C_{w2} = \frac{EA}{l} = \frac{20000}{3} = \underline{6666.6 \text{ kN/m}}$$

$$C_{w3} = \frac{3 \cdot 3000}{27} = \underline{333.3 \text{ kN/m}}$$

