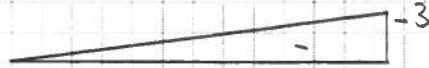


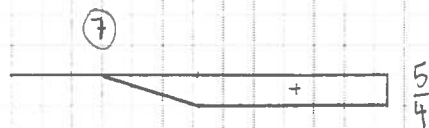
1. a)  $\eta_{25}$



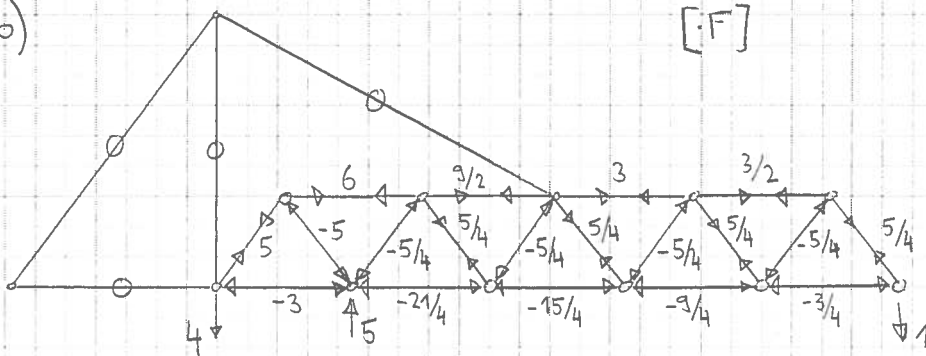
$\eta_{3-5}$



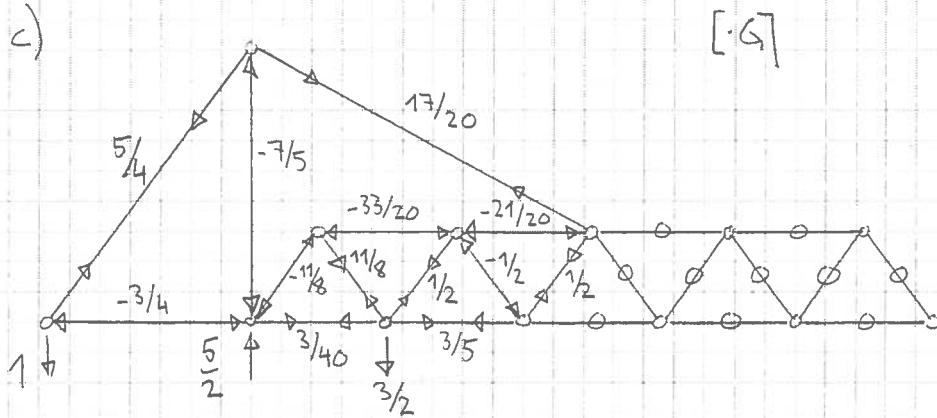
$\eta_{4-5}$



b)

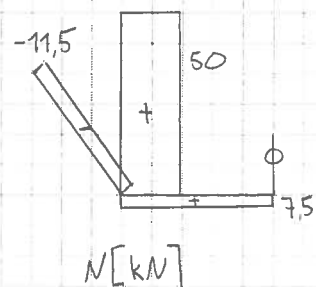
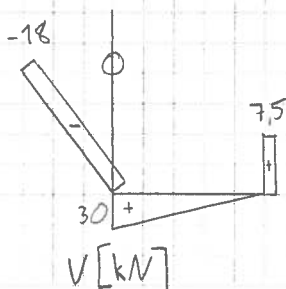
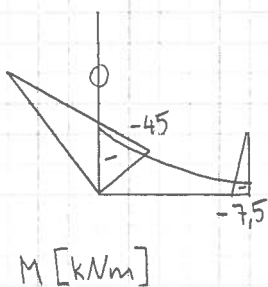


c)

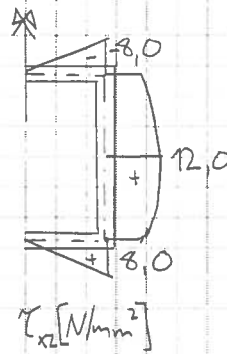
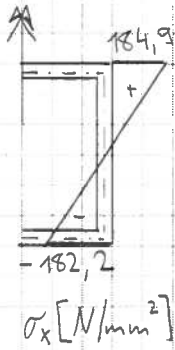


d)  $G = \frac{8440}{1489} \cdot F$

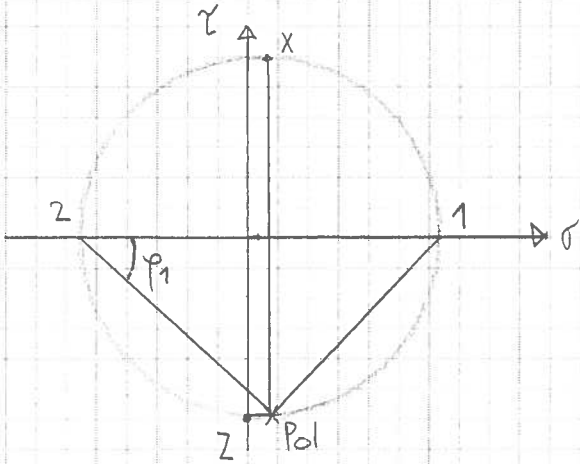
2. a)



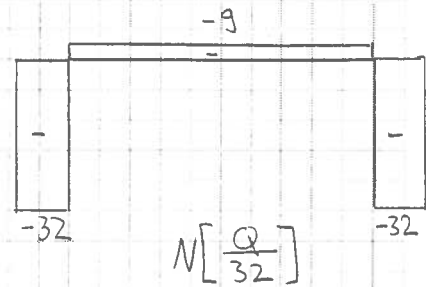
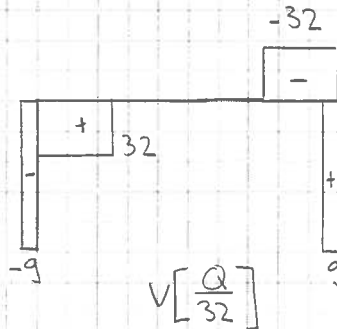
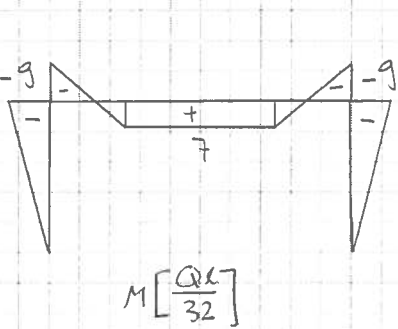
2. b)



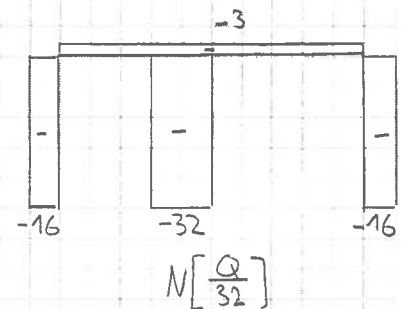
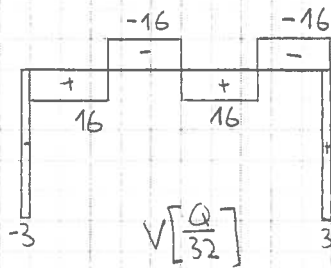
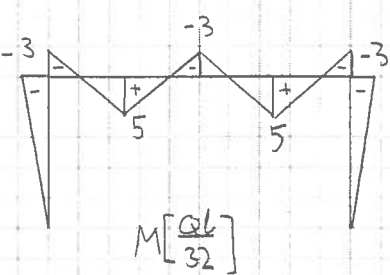
c)  $\sigma_x = 1,34 \text{ N/mm}^2$ ,  $\tau_{xz} = 11,99 \text{ N/mm}^2$ ,  $\sigma_z = 0$   
 $\sigma_1 = 12,68 \text{ N/mm}^2$ ,  $\sigma_2 = -11,34 \text{ N/mm}^2$ ,  $\varphi_1 = 43,4^\circ$



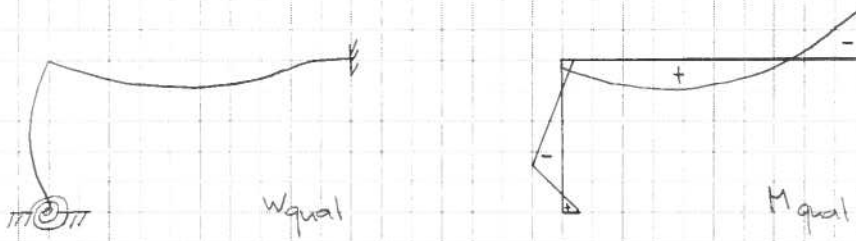
3. a)



b)

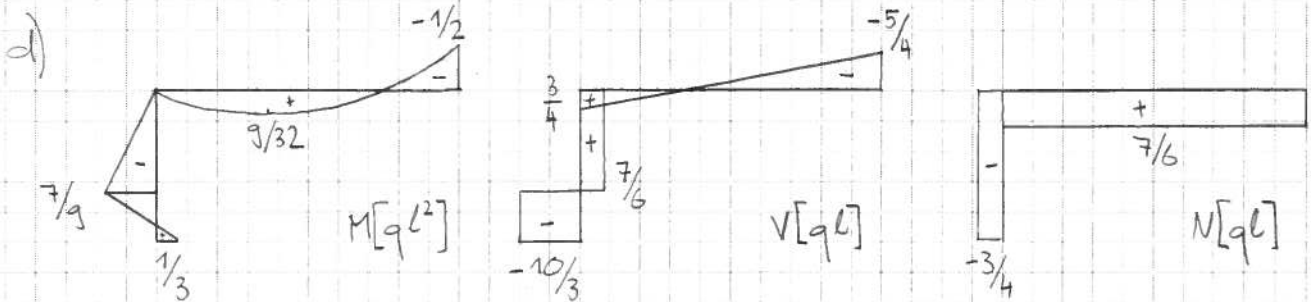


4.a)



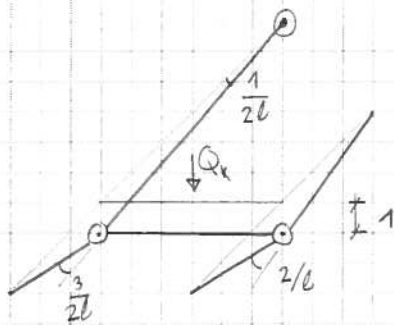
b)  $M_{12}^0 = -\frac{2ql^2}{9}$  ,  $M_{21}^0 = \frac{5ql^2}{9}$

c)  $\varphi_2 = -\frac{ql^3}{6EI}$  (Verdrehung im Uhrzeigersinn)



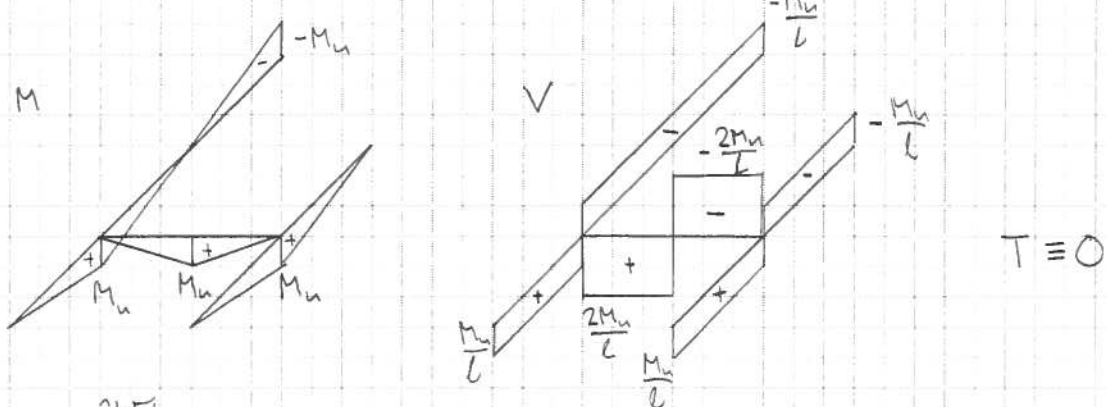
e)  $w = \frac{ql^4}{12EI}$

5.a) massgebender Mechanismus:



$Q_k = \frac{4M_{kz}}{l}$

b)



6.a)  $F_{cr} = \frac{24EI}{13l^2}$