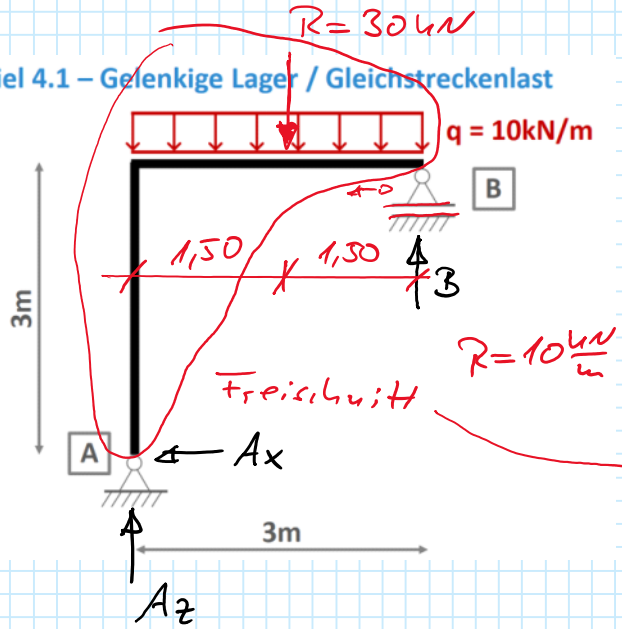
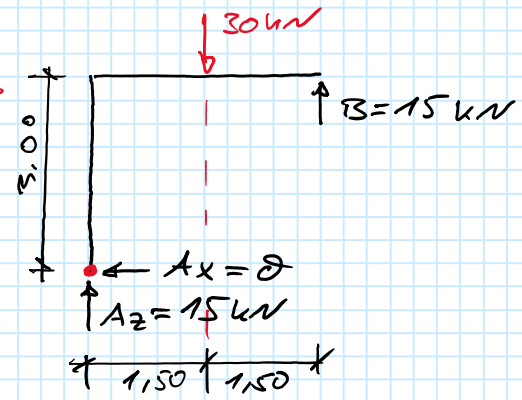
Beispiel 4.1 – Gelenkige Lager / Gleichstreckenlast



ges.: Auflagerreaktionen

$R = 10\frac{kN}{m} \cdot 3{,}0\,m = 30\,kN$

Freischnitt:



$\rightarrow: \sum F_x = 0 = -A_x \rightarrow A_x = 0$

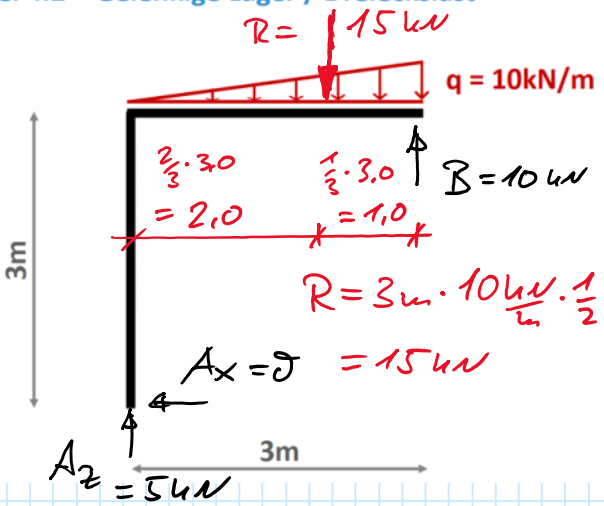
$\downarrow: \sum F_z = 0 = 30\,kN - A_z - B$ (2)

$\circlearrowleft: \sum M_A = -30\,kN \cdot 1{,}50\,m + B \cdot 3{,}0\,m = 0$

$\rightarrow B = \frac{45\,kNm}{3{,}0\,m} = 15\,kN$

in (2): $0 = 30\,kN - A_z - 15\,kN \rightarrow A_z = 30 - 15 = 15\,kN$

Beispiel 4.2 – Gelenkige Lager / Dreieckslast



$\rightarrow: \sum F_x \rightarrow A_x = 0$

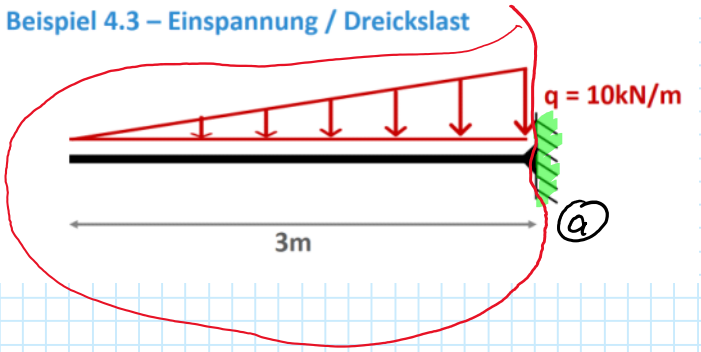
$\circlearrowleft: \sum M_A = 0 = -15 \cdot 2{,}0 + B \cdot 3{,}0$

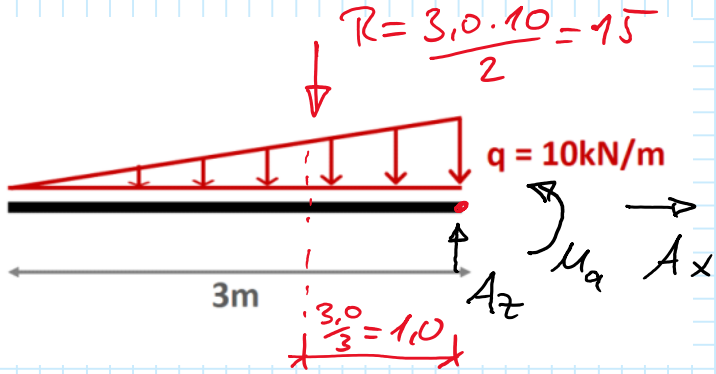
$\rightarrow B = \frac{30}{3} = 10\,kN$

$\downarrow: \sum F_z = 0 = 15 - 10 - A_z \quad | + A_z$

$\rightarrow A_z = 5\,kN$

Beispiel 4.3 – Einspannung / Dreickslast





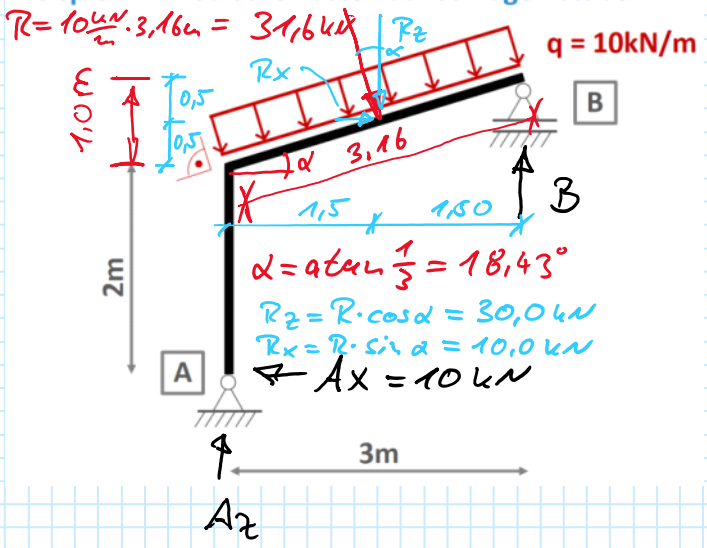
$\rightarrow \sum F_x = 0 \rightsquigarrow A_x = 0$

$\downarrow \sum F_z = R - A_z \rightsquigarrow A_z = R = 15\ kN$

$\curvearrowleft \sum M_a = 0 = 15\ kN \cdot 1{,}0\ m + M_a$

$\rightsquigarrow M_a = -15\ kNm$

Beispiel 4.4 – Streckenlasten auf schrägen Stäben



$\rightarrow \sum F_x = 0 = -A_x + R_x = -A_x + 10$

$\rightsquigarrow A_x = 10\ kN$

$\curvearrowleft \sum M_a = 0 = +B \cdot 3{,}0 - 30{,}0 \cdot 1{,}5 - 10{,}0 \cdot 2{,}5$

$= 3{,}0 \cdot B - 70{,}0 \rightsquigarrow B = \frac{70}{3{,}0} = 23{,}3\ kN$

$\downarrow \sum F_z = 0 = -23{,}3 + 30 - A_z$

$\rightsquigarrow A_z = 6{,}7\ kN$

Beispiel 4.5 – Streckenlasten auf schrägen Stäben