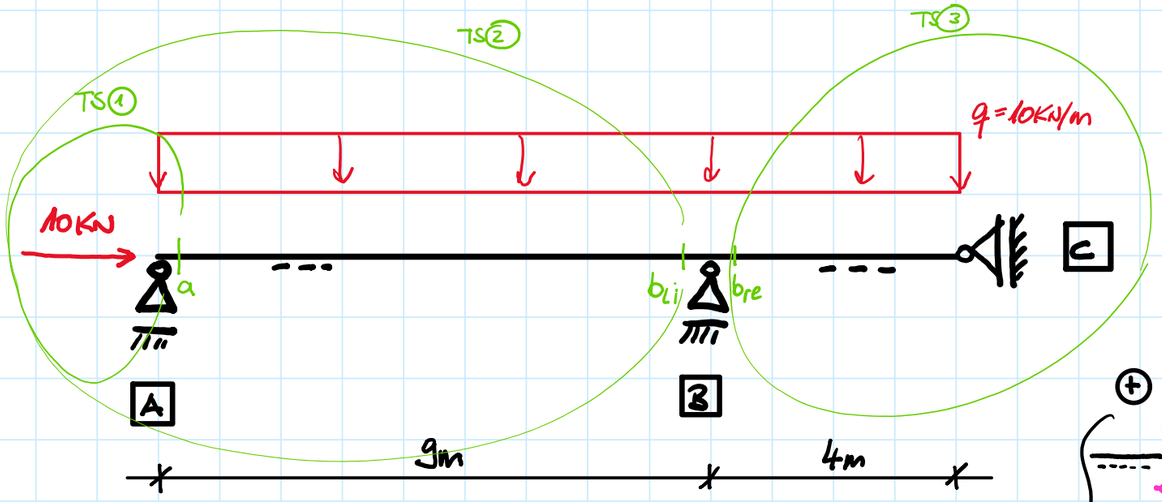
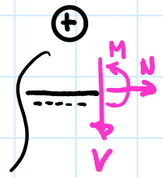
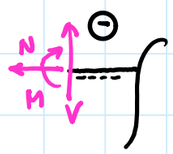
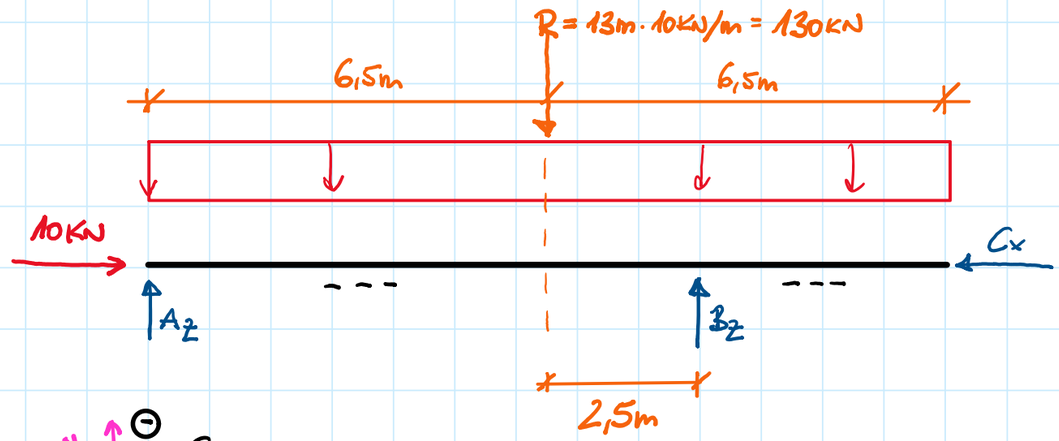
Montag, 25. November 2024 13:51







① Berechnung Auflager



GGB:

$\sum F_{i,x} = 0$:

$\rightarrow$: $10 - C_x = 0 \Rightarrow C_x = 10\,KN$

$\sum M_{i,b} = 0$

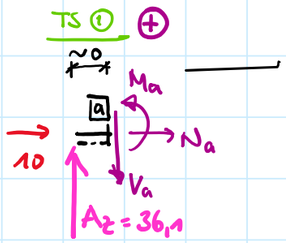
(B) : $-A_z \cdot 9m + R \cdot 2{,}5m = 0$

$130 \cdot 2{,}5 / 9 = A_z = 36{,}11\,KN$

$\sum F_{i,z} = 0$:

$\downarrow$: $-A_z + R - B_z = 0$

$-36{,}11 + 130 = B_z = 93{,}89\,KN$



GGB:

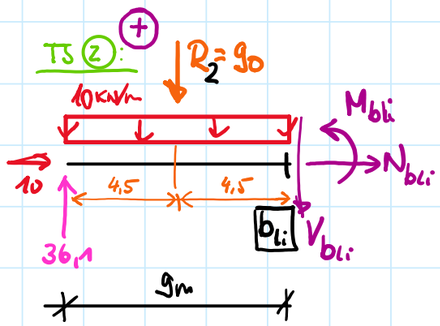
$\rightarrow$: $Na + 10 = 0$

$Na = -10\,KN$

$\downarrow$: $Va - A_z = 0$

$Va = 36{,}1\,KN$

(a) : $Ma = 0$



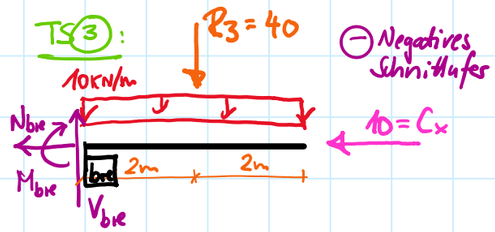
$\rightarrow$: $N_{bli} = -10\,KN$

$\downarrow$: $V_{bli} + R_2 - 36{,}1 = 0$

$V_{bli} = 36{,}1 - 90 = -53{,}89\,KN$

(bli) : $M_{bli} + R_2 \cdot 4{,}5m - 36{,}1 \cdot 9m = 0$

$M_{bli} = 36{,}1 \cdot 9 - 90 \cdot 4{,}5 = -80\,KNm$



⊖ Negatives Schnittufer

$\rightarrow$: $-N_{bre} - C_x = 0$

$-10KN = N_{bre}$

$\downarrow$: $R_3 - V_{bre} = 0 \Rightarrow V_{bre} = +40KN$

(bre) : $-M_{bre} - R_3 \cdot 2m = 0$

$M_{bre} = -40 \cdot 2 = -80\,KNm$

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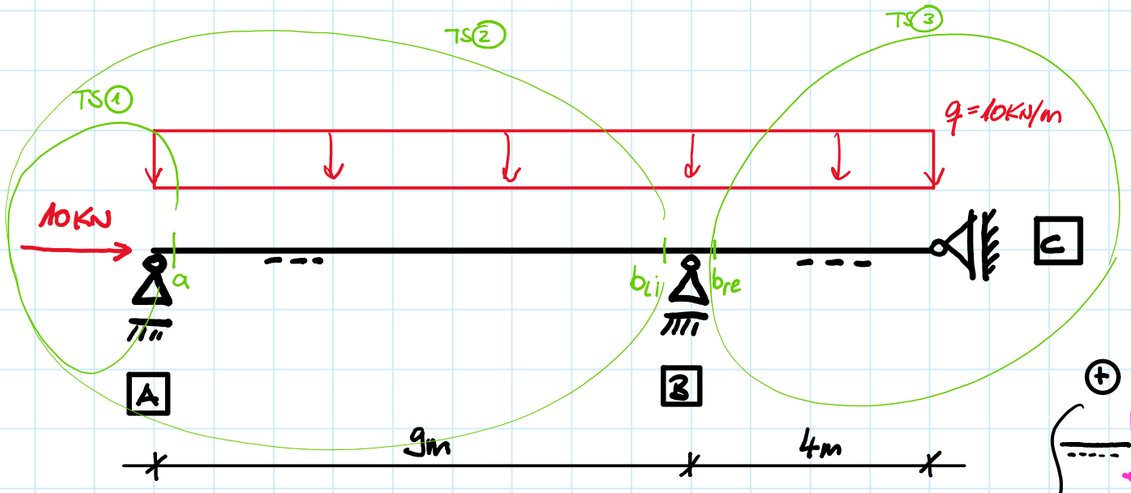
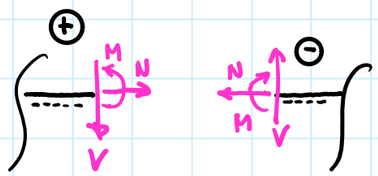
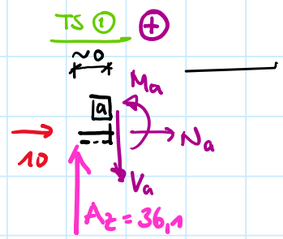






GGB:

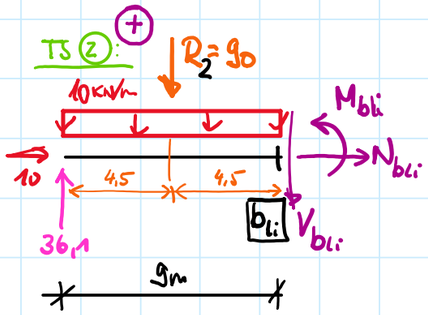
→: $N_a + 10 = 0$

$N_a = -10\,KN$

↓: $V_a - A_z = 0$

$V_a = 36{,}1\,KN$

a: $M_a = 0$



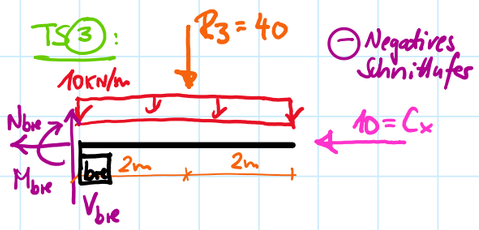
→: $N_{bli} = -10\,KN$

↓: $V_{bli} + R_2 - 36{,}1 = 0$

$V_{bli} = 36{,}1 - g_0 = -53{,}89\,KN$

bli: $M_{bli} + R_2 \cdot 4{,}5m - 36{,}1 \cdot 9m = 0$

$M_{bli} = 36{,}1 \cdot 9 - 90 \cdot 4{,}5 = -80\,KNm$



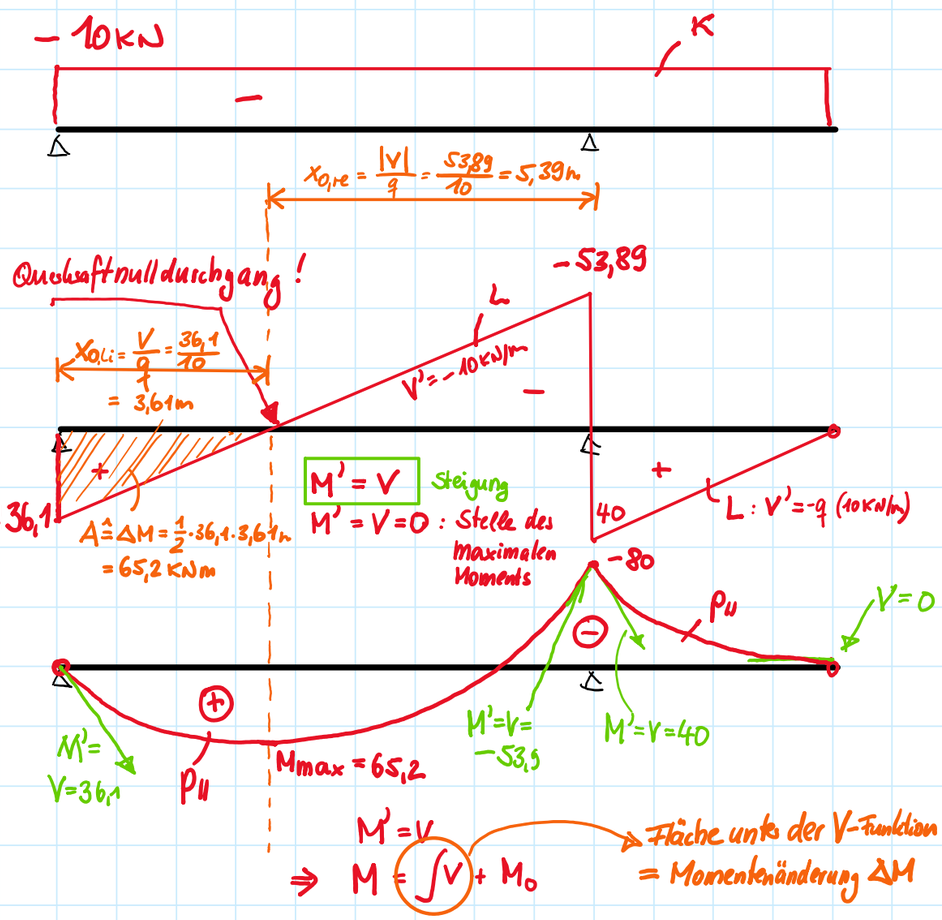
→: $-N_{bre} - C_x = 0$

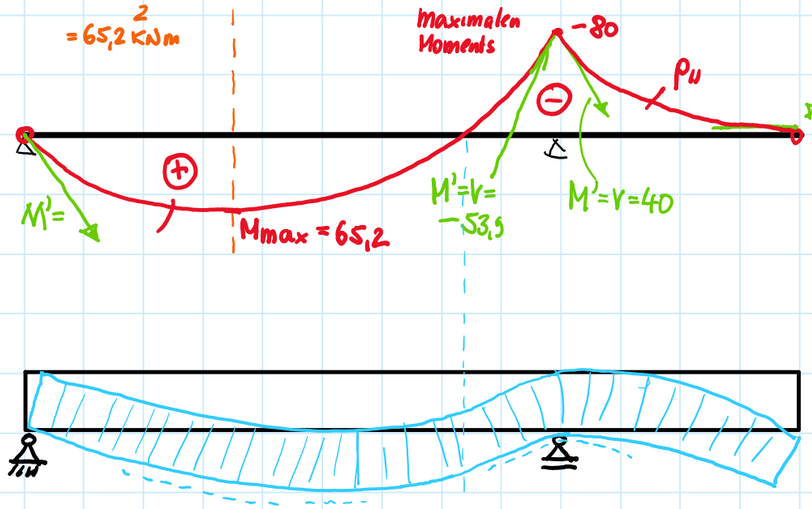
$-10KN = N_{bre}$

↓: $R_3 - V_{bre} = 0 \Rightarrow V_{bre} = +40KN$

bre: $-M_{bre} - R_3 \cdot 2m = 0$

$M_{bre} = -40 \cdot 2 = -80\,KNm$





$M'' = -q$

$\uparrow$

$M' = V$

$\uparrow$

$M =$

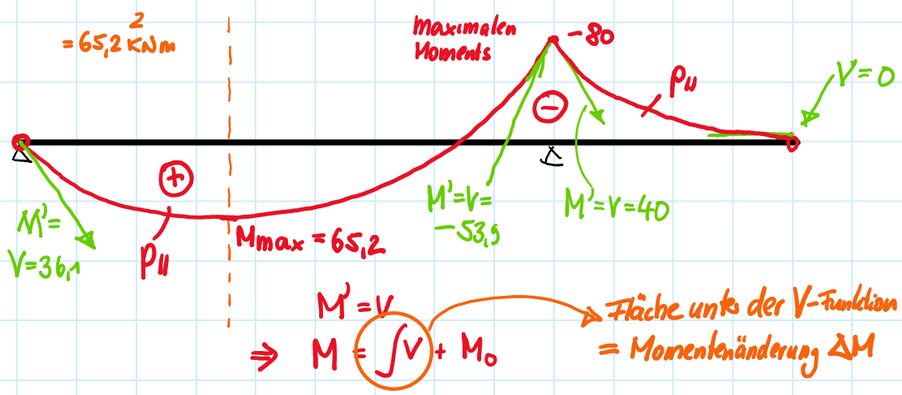
$\downarrow$

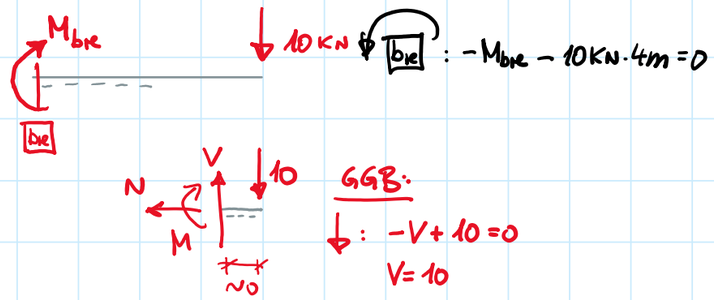
$\int M =$ Krümmung

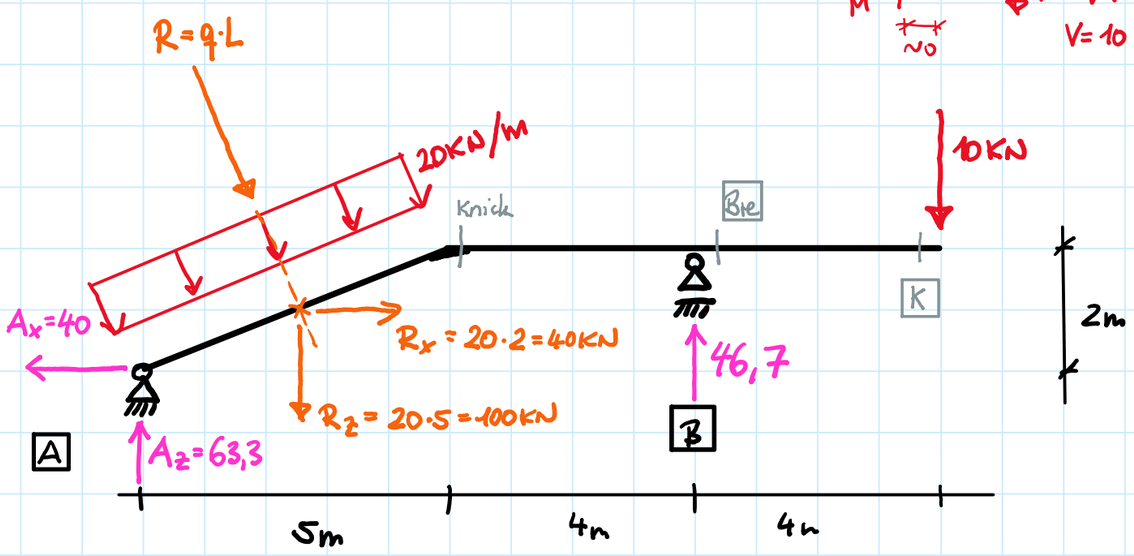
$\downarrow$

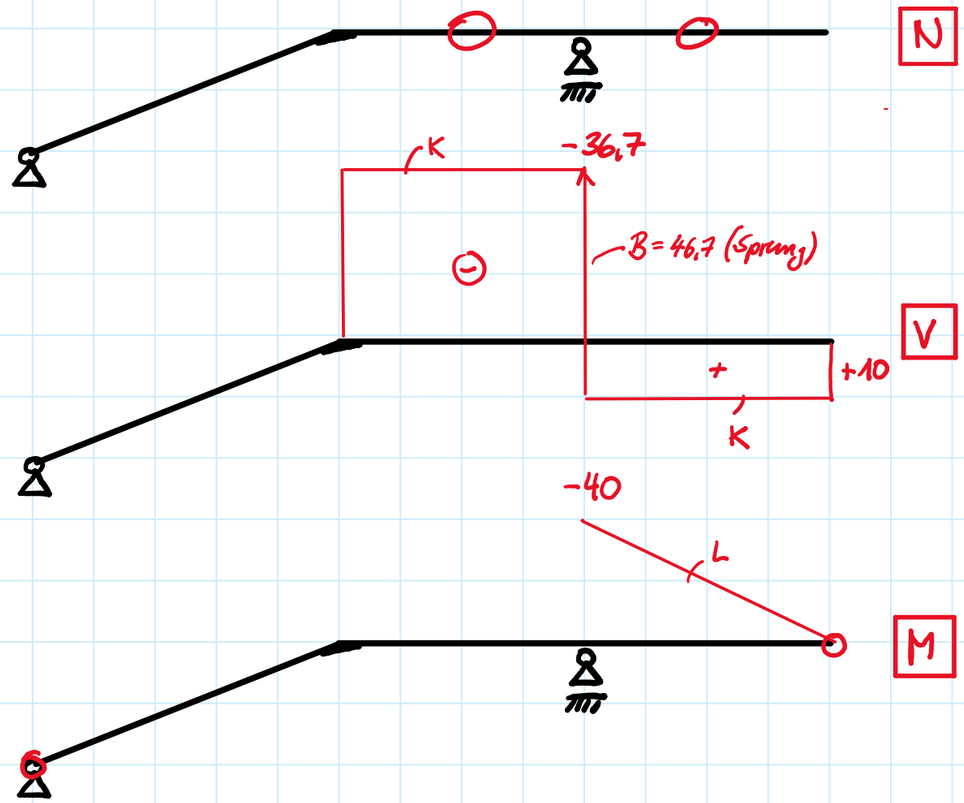
$\iint M =$ Durchbiegung

M




M_{bre}
10 KN
bre
$-M_{bre} - 10KN \cdot 4m = 0$
N
V
10
M
GGB:
$-V + 10 = 0$
$V = 10$


R = q·L
20KN/m
Knick
Bre
10KN
K
$A_x = 40$
$R_x = 20 \cdot 2 = 40KN$
$R_z = 20 \cdot 5 = 100KN$
46,7
2m
A
$A_z = 63,3$
B
5m
4m
4m


N
K
-36,7
B = 46,7 (Sprung)
V
+10
K
-40
L
M