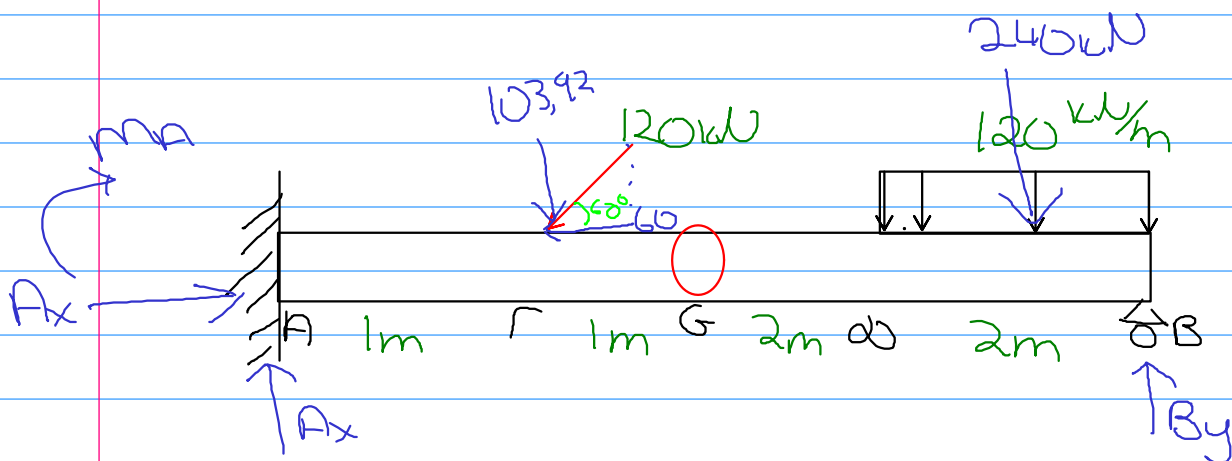
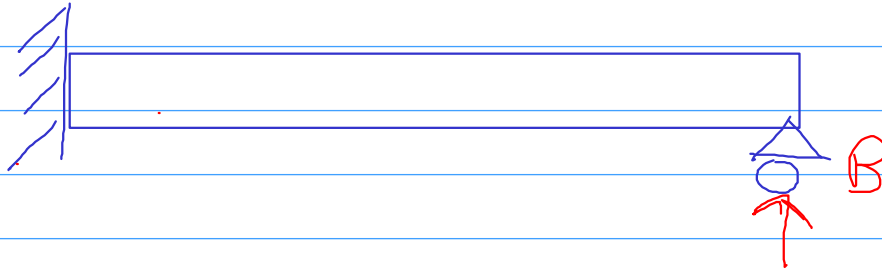
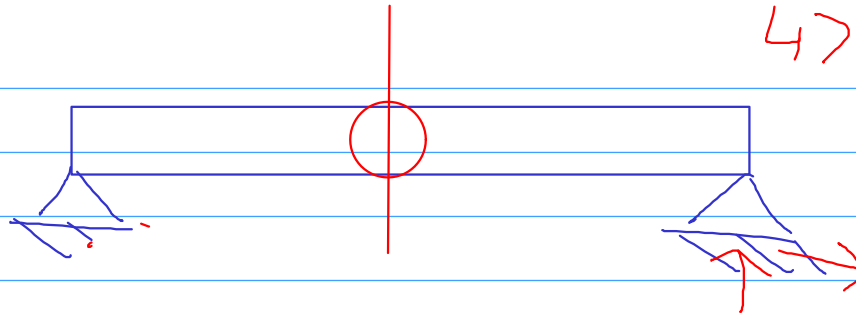


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$$\sum F_x = 0$$

$$A_x - 60 = 0$$

$$A_x = 60 \text{ kN}$$

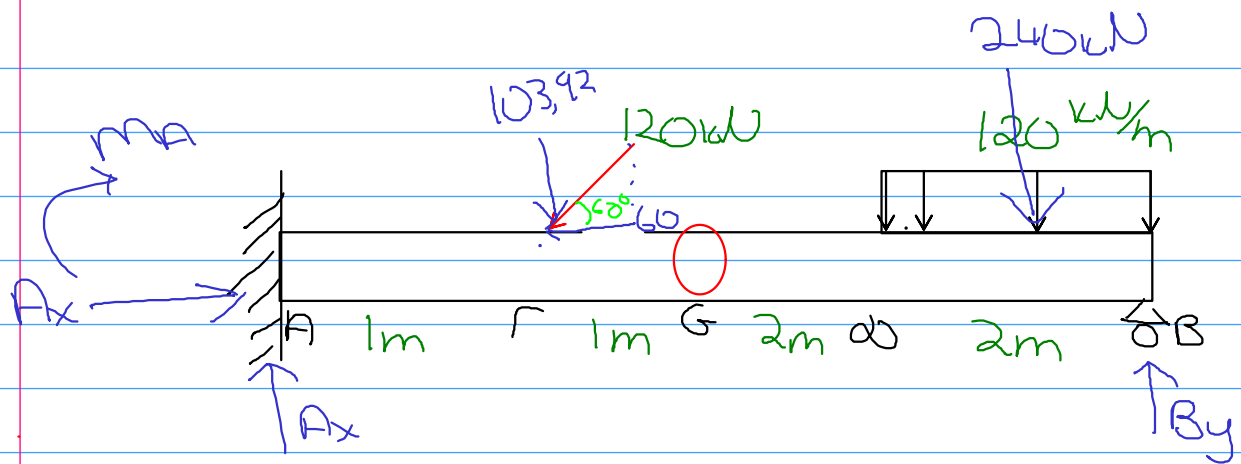
$$A_y = 163,92 \text{ kN}$$

$$\sum F_y = 0$$

$$A_y - 103,92 - 240 + B_y = 0$$

$$A_y + B_y = 343,92$$

$$\Rightarrow A_y + 180 = 343,92$$

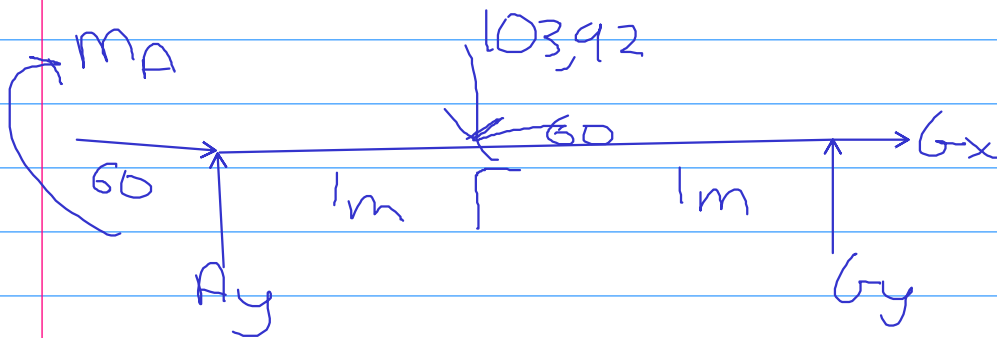


$$(4) \sum M_A = 0$$

$$-M_A - 103,92 \cdot 1 - 240 \cdot 5 + B_y \cdot 6 = 0$$

$$6B_y - M_A = 1303,92 \Rightarrow 6 \cdot 180 - M_A = 1303,92$$

$$M_A = -223,92 \text{ kNm}$$



$$(5) \sum M_G = 0$$

$$-M_A - A_y \cdot 2 + 103,92 \cdot 1 = 0$$

$$M_A + 2A_y = 103,92$$

$$-223,92 + 2 \cdot 163,92 = 103,92$$

$$0 = 0 \Rightarrow 10 \times 0 \text{ E1}$$

ΣFx=0

$$60 - 0 - 60 = 0$$

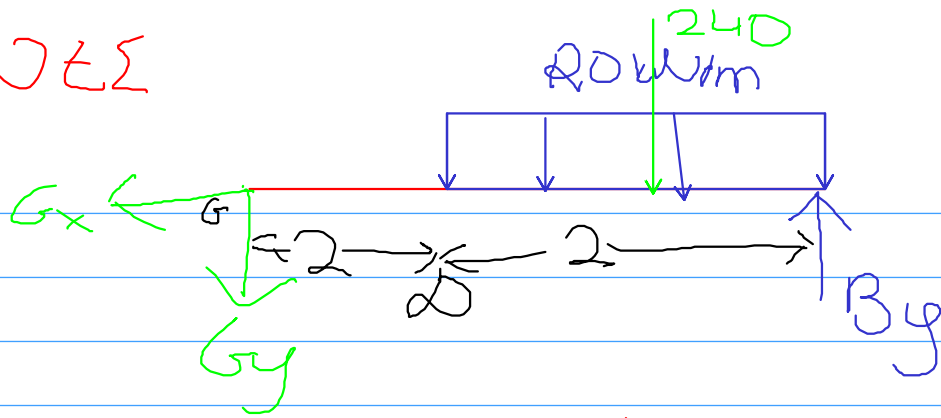
$$0 = 0 \Rightarrow 10 \times 0 \text{ E1}$$

$$\sum Fy = 0$$

$$63,92 - 103,92 + 60 = 0$$

$$0 = 0 \Rightarrow 10 \times 0 \text{ E1}$$

20 kN/m



$$(\pm) \sum M_G = 0$$

$$4 B_y - 240 \cdot 3 = 0$$

$$B_y = 180$$

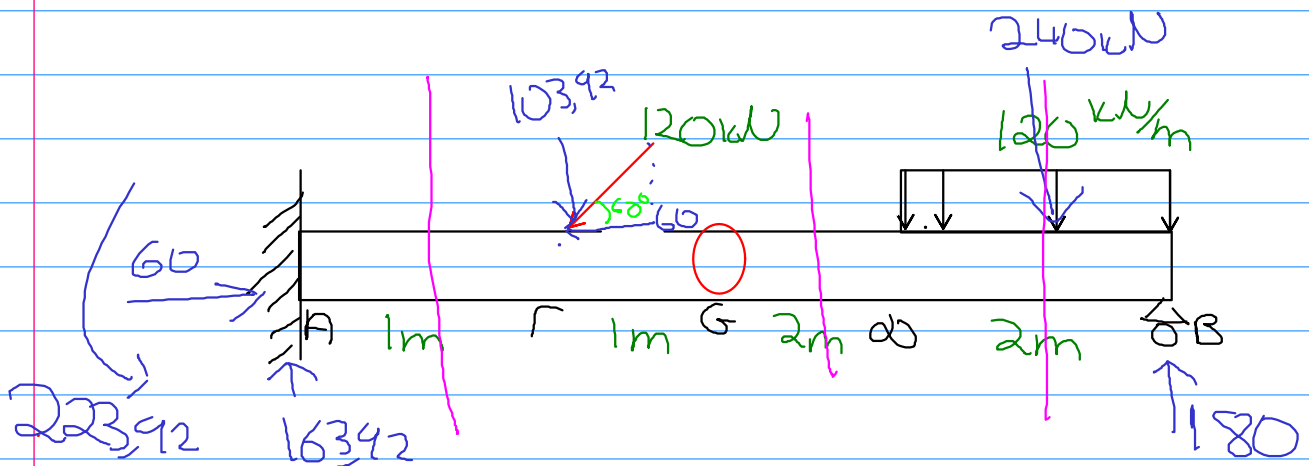
$$(\pm) \sum f_x = 0$$

$$G_x = 0 \text{ kN}$$

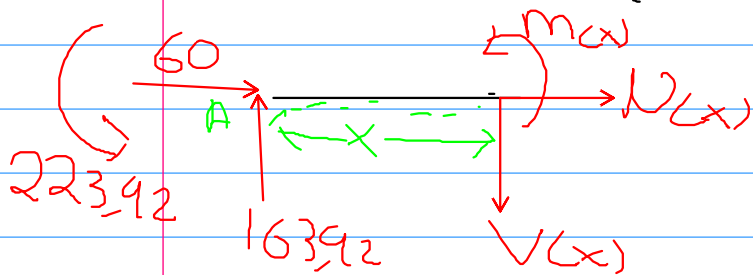
$$(\pm) \sum f_y = 0$$

$$-G_y - 240 + 180 = 0$$

$$G_y = -60 \text{ kN}$$



Top 1020 Topu A $0 \leq x \leq 1 \text{ m}$



$$(\pm) \sum f_x = 0$$

$$N(x) + 60 = 0$$

$$N(x) = -60 \text{ kN}$$

$$(\pm) \sum f_y = 0$$

$$163.92 - V(x) = 0$$

$$V(x) = 163.92 \text{ kN}$$

$$(\uparrow) \sum M_x = 0$$

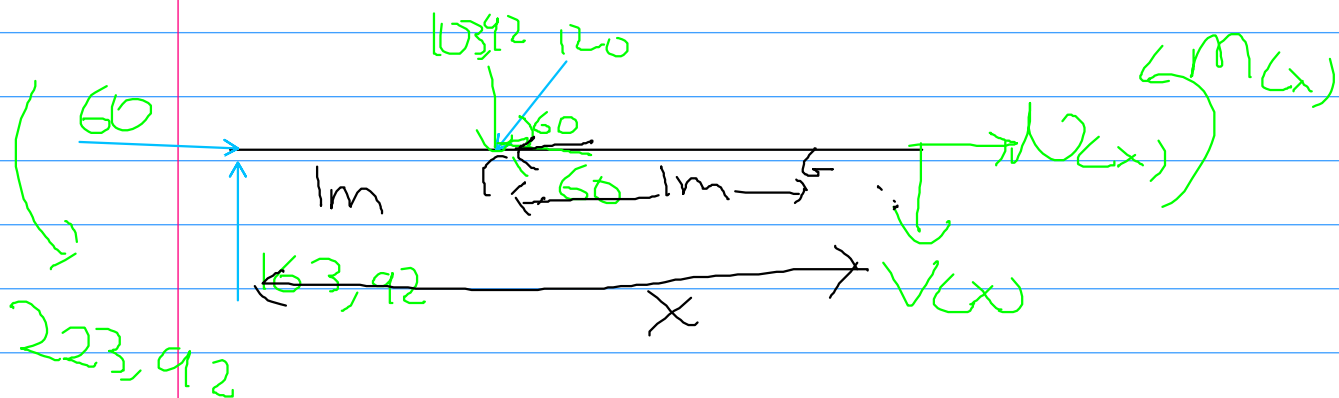
$$-163,92x + 223,92 + M(x) = 0$$

$$M(x) = 163,92x - 223,92$$

$$A \circ \Gamma_a x=0 \Rightarrow M(0) = -223,92 \text{ kNm}$$

$$\Gamma \circ \Gamma_a x=1 \Rightarrow M(1) = -60 \text{ kNm}$$

Τμήμα Γδ $1 \leq x \leq 4 \text{ (m)}$



$$(\uparrow) \sum F_x = 0$$

$$60 - 60 + N(x) = 0$$

$$N(x) = 0 \text{ kN}$$

$$(\uparrow) \sum F_y = 0$$

$$163,92 - 103,92 - V(x) = 0$$

$$V(x) = 60 \text{ kN}$$

$$(\uparrow) \sum M_x = 0$$

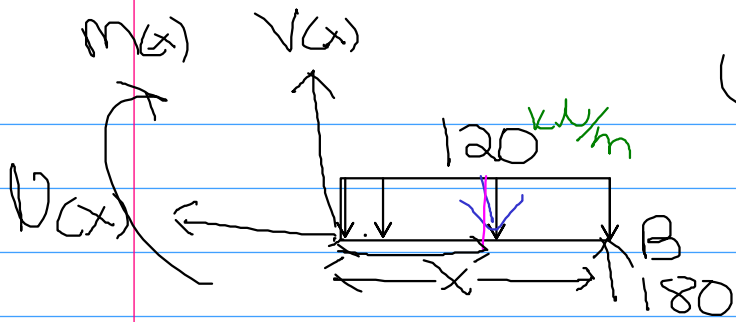
$$223,92 + 103,92 \cdot (x-1) + M(x) = 163,92x$$

$$M(x) = -223,92 - 103,92(x-1) + 163,92x$$

$$\Gamma \circ \Gamma_a x=1 \Rightarrow M(1) = -60 \text{ kNm}$$

$$2 \circ \Gamma_a x=4 \Rightarrow M(4) = 120 \text{ kNm}$$

$$0 \leq x \leq 2 \text{ m}$$



$$\rightarrow \sum F_x = 0$$

$$-N(x) = 0$$

$$N(x) = 0$$

$$(+\uparrow) \sum F_y = 0$$

$$V(x) - 120x + 180 = 0$$

$$V(x) = 120x - 180$$

$$B_0 \text{ f\"ur } x=0 \Rightarrow V(0) = -180 \text{ kN}$$

$$2) \text{ f\"ur } x=2 \Rightarrow V(2) = 60 \text{ kN}$$

$$(+\curvearrowright) \sum M_x = 0$$

$$-M(x) + 180x - 120x \cdot \frac{x}{2} = 0$$

$$B_0 M(0) = 0 \text{ kNm}$$

$$2) M(2) = -120 \text{ kNm}$$

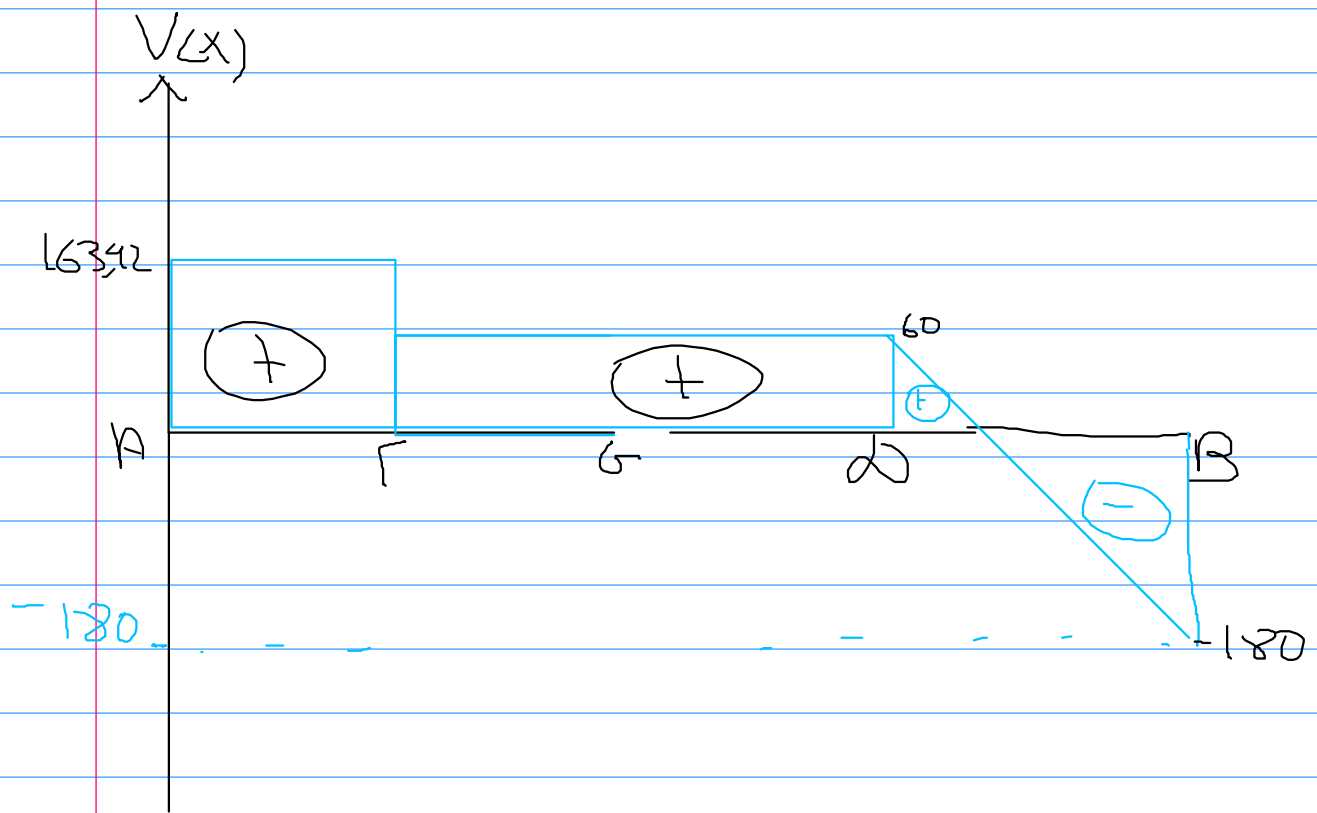
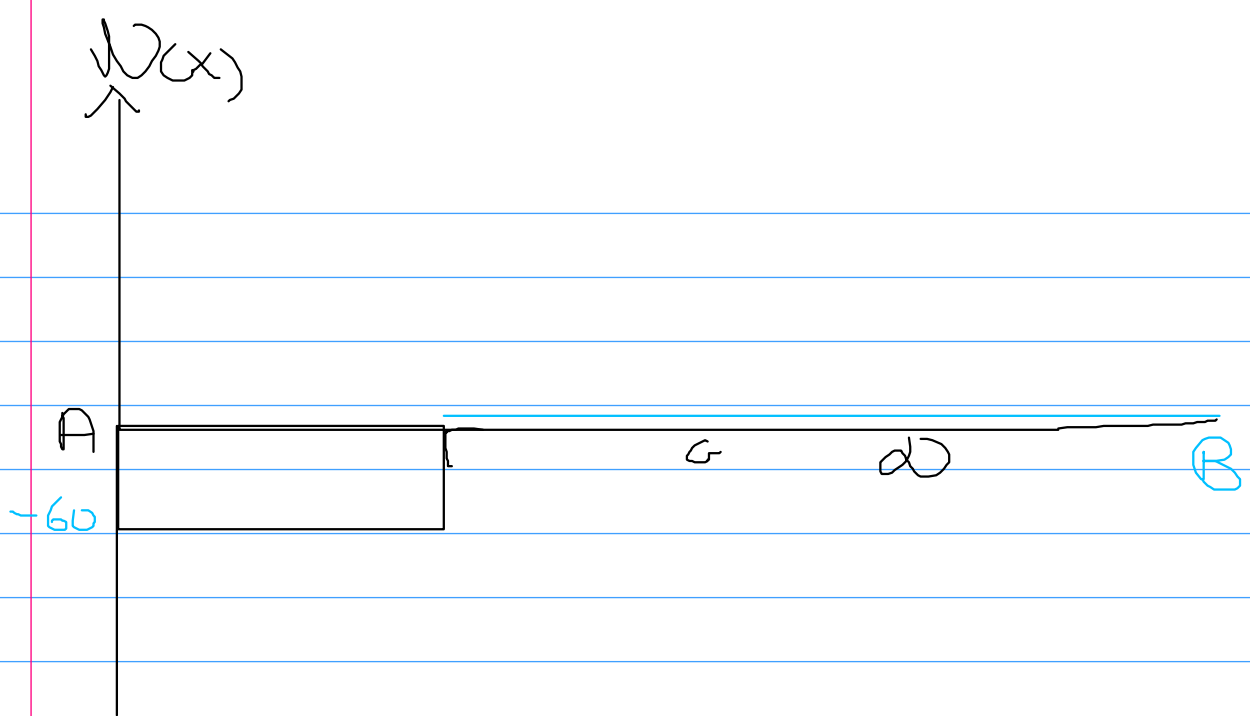
$$M(x) = 60x^2 - 180x$$

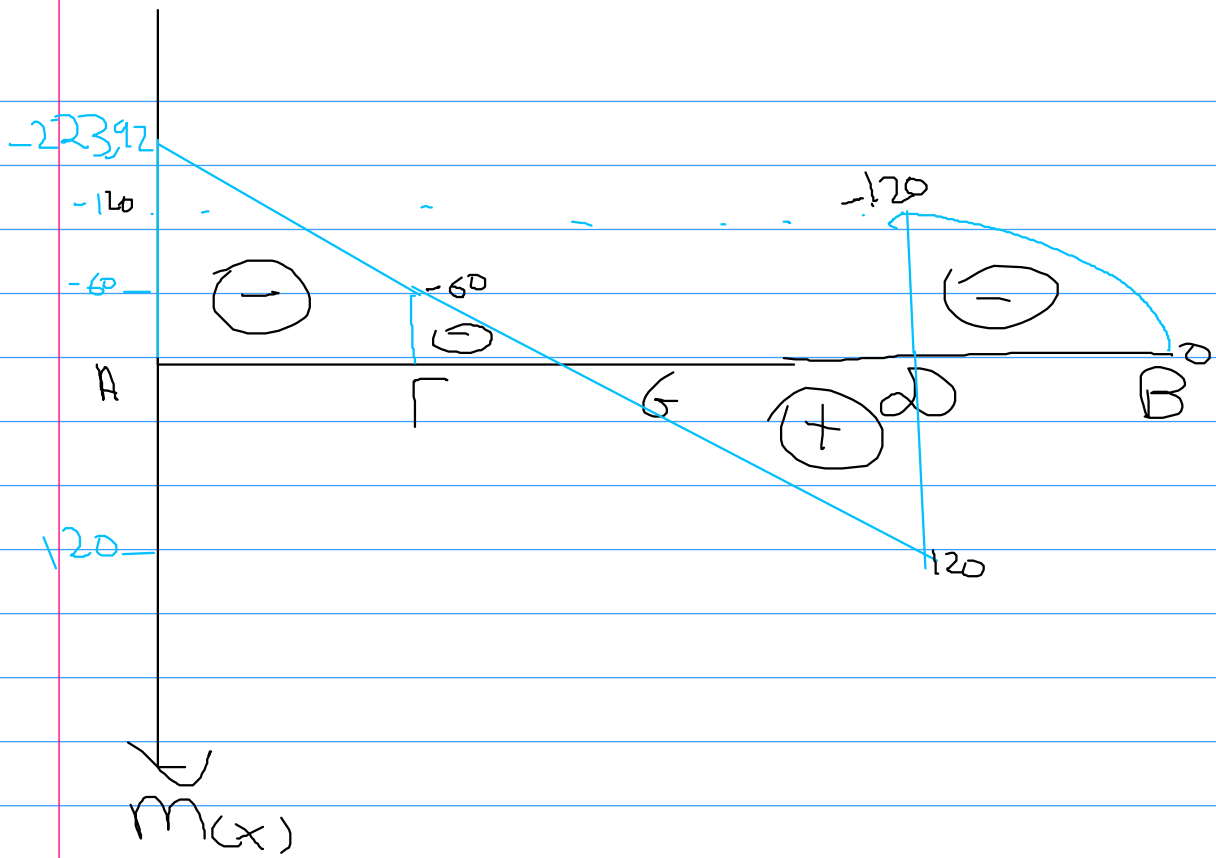
$$\frac{dM(x)}{dx} = 120x - 180 = 0$$

$$120x = +180$$

$$x = 1,5 \text{ m}$$

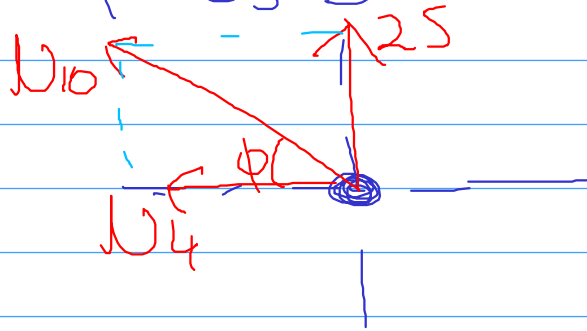
$$\frac{d^2M(x)}{dx^2} = 120 > 0 \text{ Wdh}$$





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Kaplos B



$$\sum \phi \phi = \frac{1,15}{2} \Rightarrow \phi = 29,8^\circ$$

$$(\rightarrow) \sum F_x = 0$$

$$-N_{10x} - N_4 = 0$$

$$N_{10x} = -N_4$$

$$N_{10} = -\frac{N_4}{\cos 29,8^\circ}$$

$$(\uparrow) \sum F_y = 0$$

$$25 + N_{10y} = 0$$

$$N_{10y} = -25$$

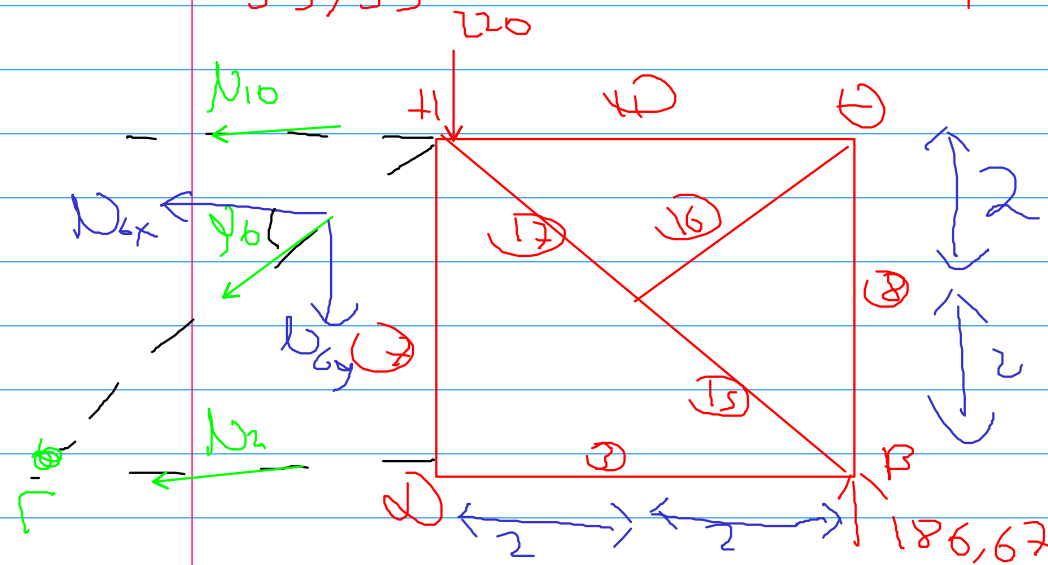
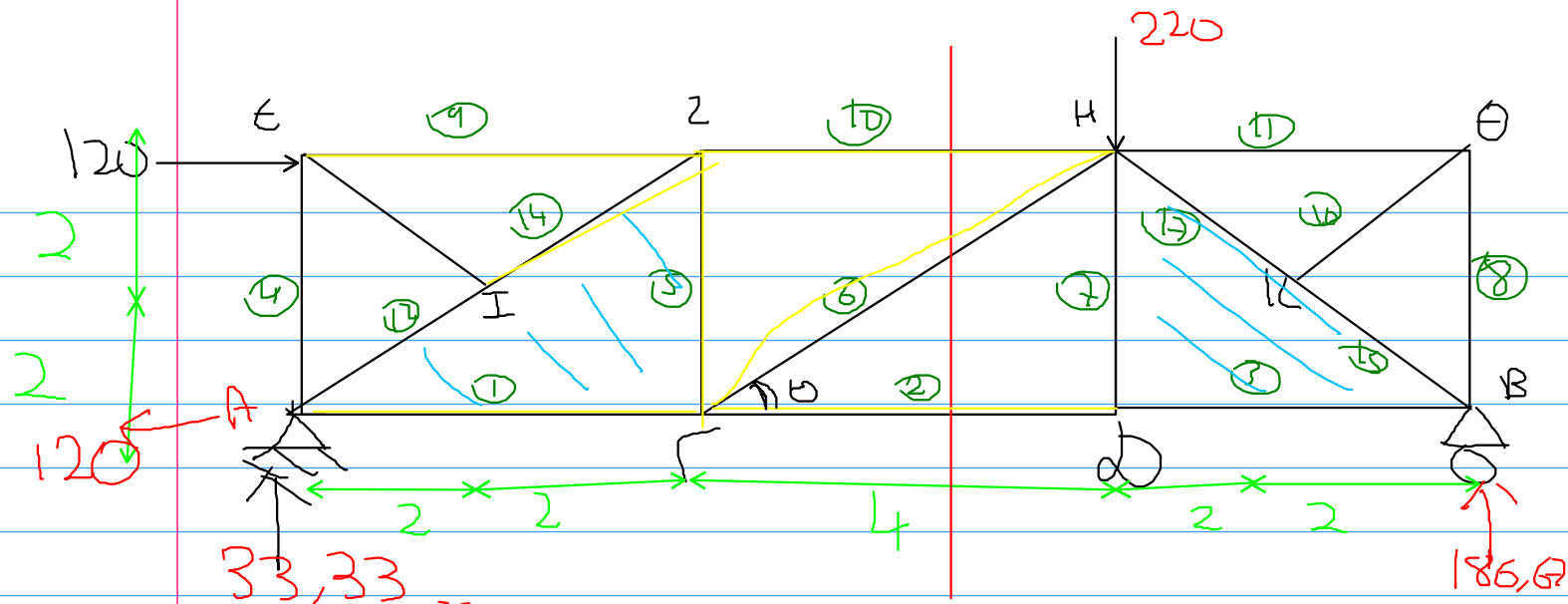
$$N_{10} = -25$$

$$\sin 29,8^\circ$$

$$N_{10} = -50,14$$

$$50 \cdot 0,865 = N_4$$

$$N_4 = 43,25 \text{ kN}$$



$$\tan \theta = \frac{4}{4} = 45^\circ$$

$$\sum F_x = 0$$

$$-N_2 - N_{10} - N_{6x} = 0$$

$$-N_2 - N_{10} - N_6 \cdot \cos 45 = 0 \Rightarrow N_{10} = -153,33 \text{ kN}$$

$$\sum F_y = 0$$

$$-N_{6y} - 220 + 186,67 = 0$$

$$N_{6y} = -33,33$$

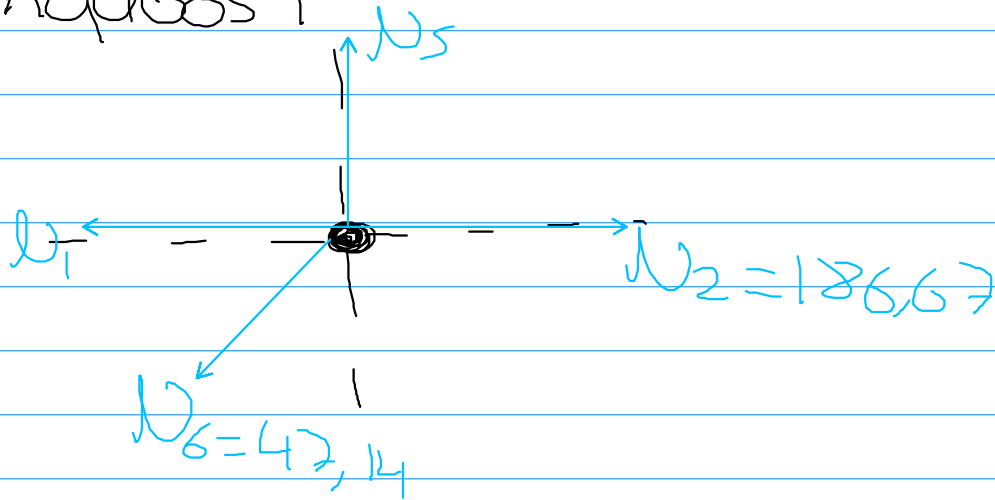
$$N_6 = \frac{-33,33}{\frac{\sqrt{2}}{2}} \Rightarrow N_6 = -47,11 \text{ kN}$$

$$\sum M_A = 0$$

$$18667 \cdot 4 - N_2 \cdot 4 = 0$$

$$N_2 = 18667 \text{ N}$$

Körper



$$\sum F_x = 0$$

$$18667 - N_1 - 42,11 \cdot \cos 45 = 0$$

$$N_1 = 183,36 \text{ N}$$

$$\sum F_y = 0$$

$$N_3 = 33,11 \text{ N}$$