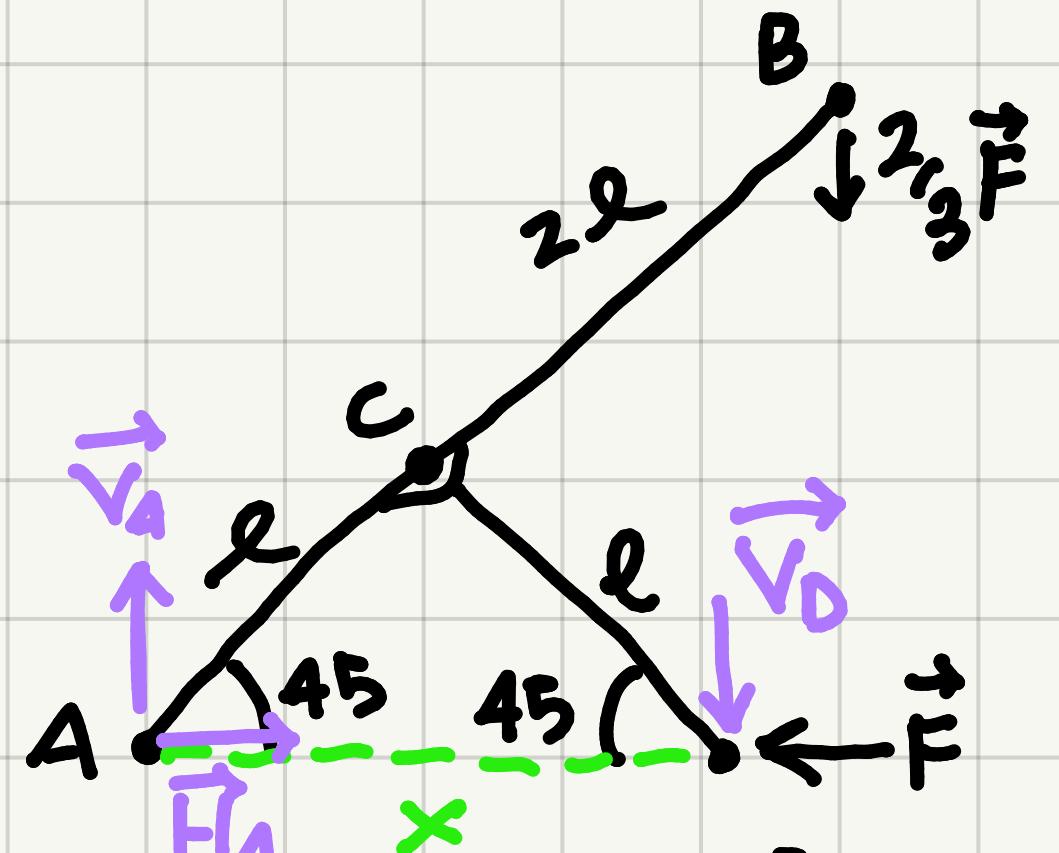


REAZIONI VINCOLARI IN A, C, D?

AZIONI INTERNE AB?

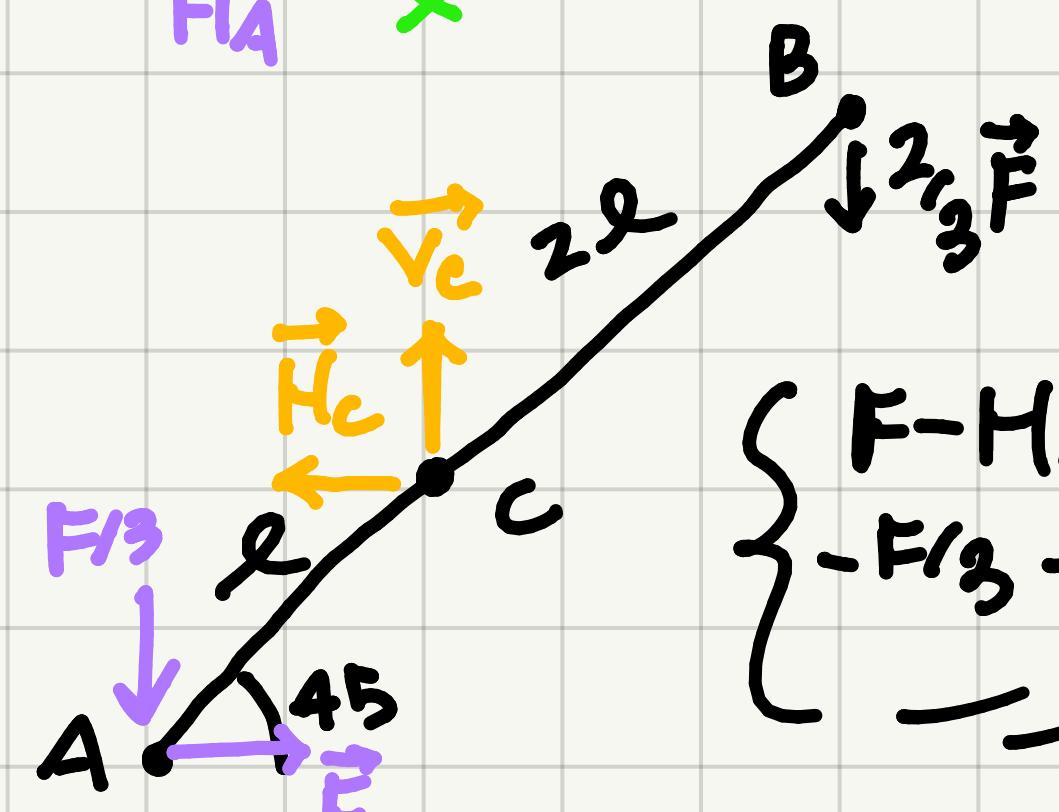
$$n = 3 \cdot 2 - (C_2_A + 2_C + 1_D + 1_B) = 0$$



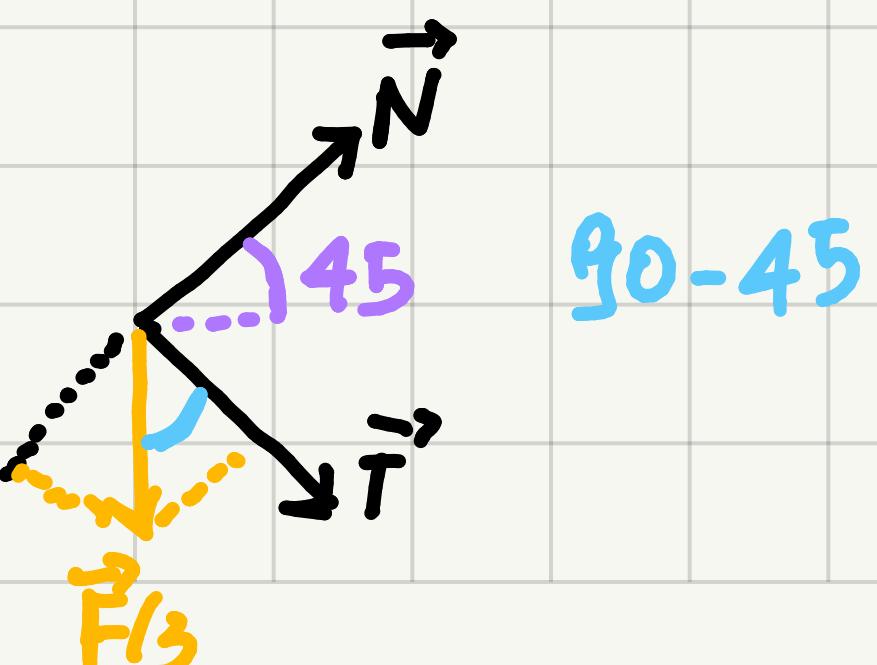
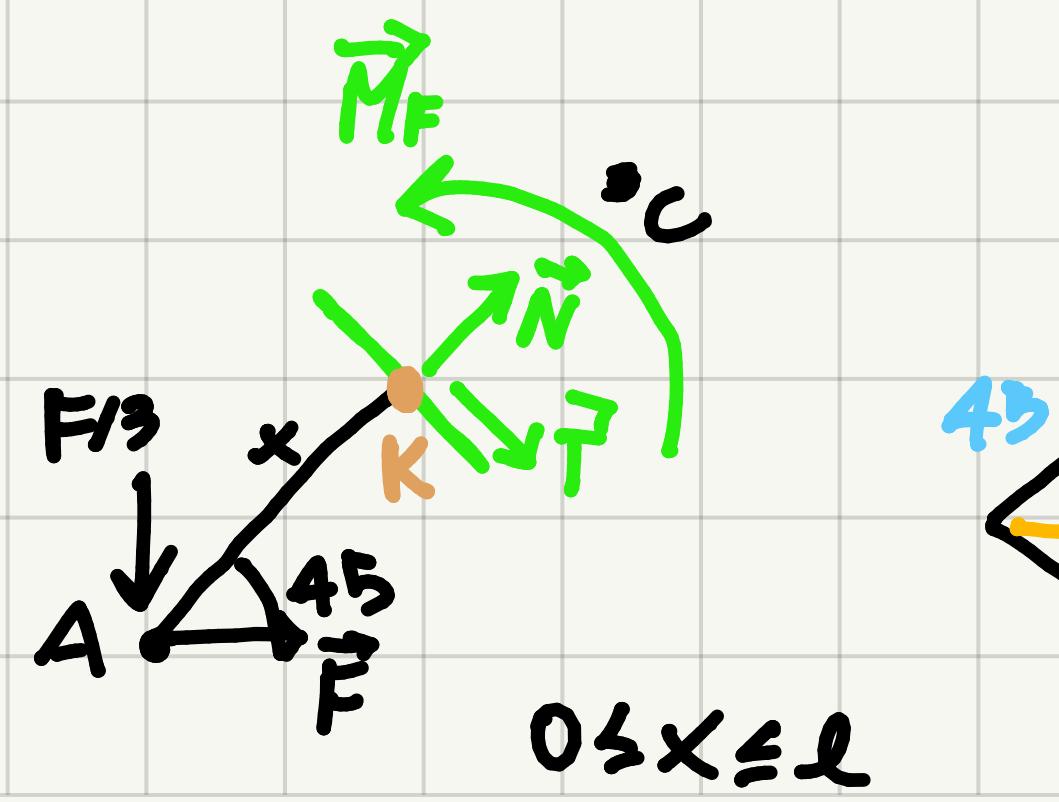
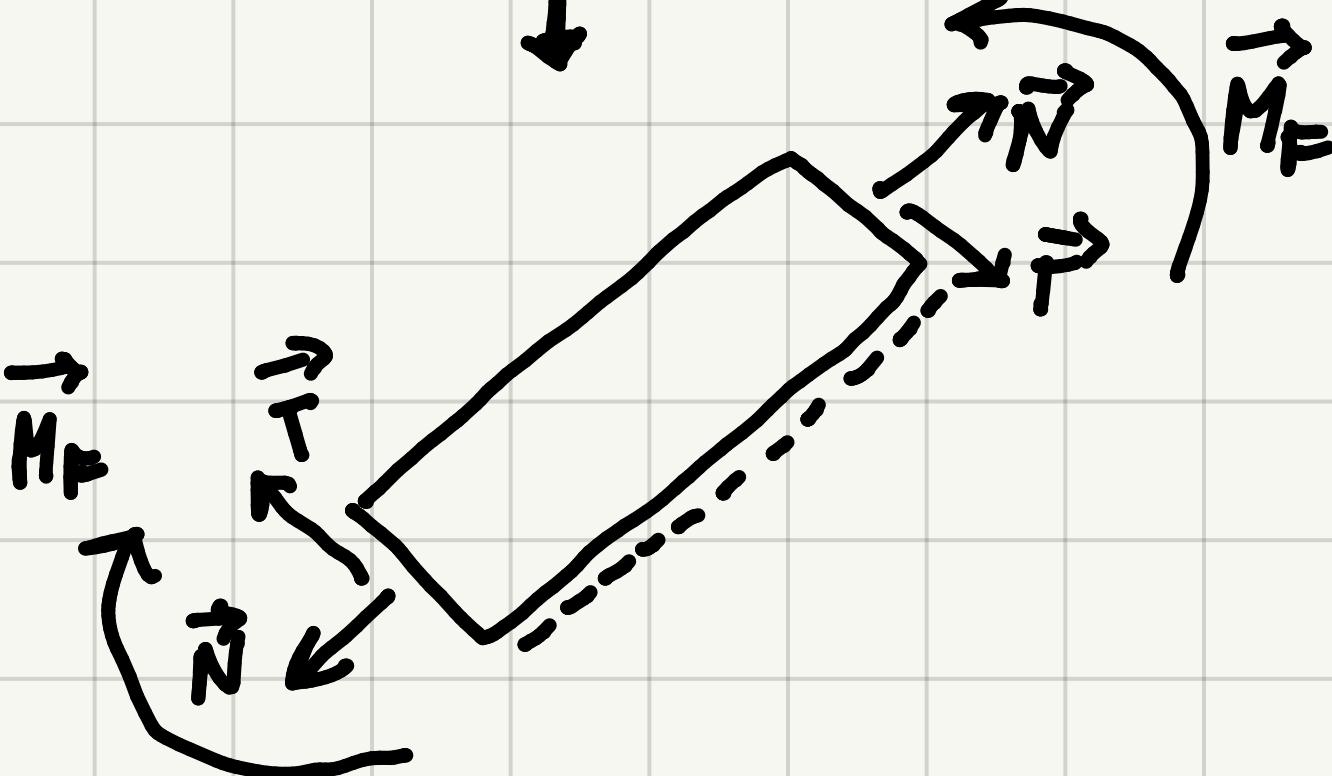
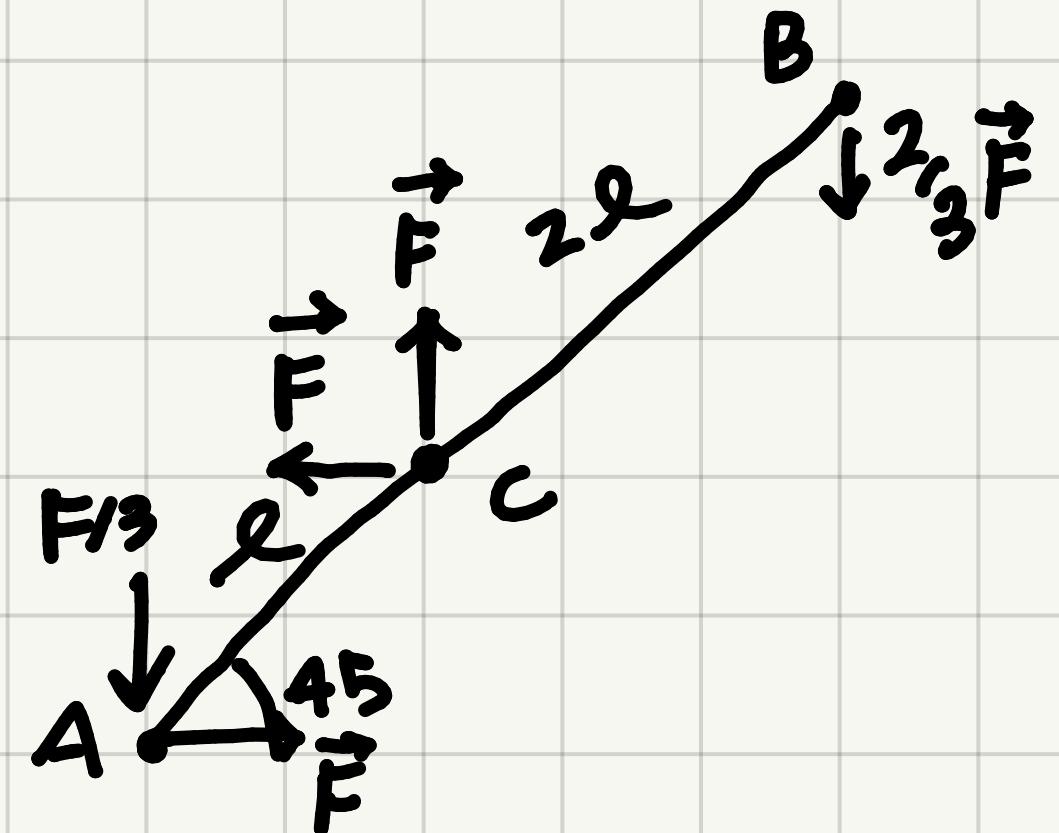
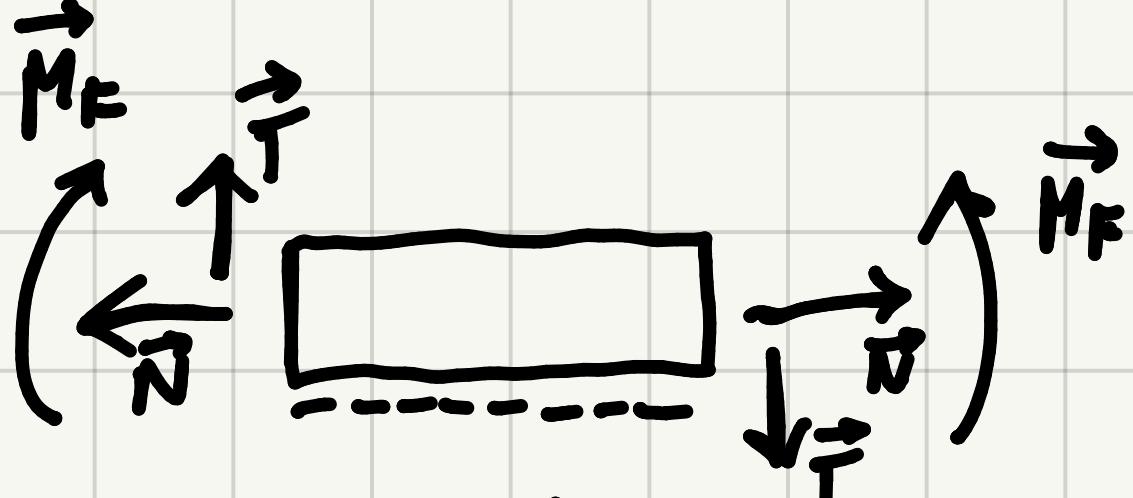
$$x = \sqrt{l^2 + l^2} = l\sqrt{2}$$

$$\begin{cases} H_A - F = 0 \\ V_A - \frac{2}{3}F - V_D = 0 \\ -V_D - \frac{2}{3} \cdot 3lF \sin(45^\circ) = 0 \end{cases}$$

$$\begin{cases} H_A = F \\ V_A = -\frac{1}{3}F \\ V_D = -F \end{cases}$$

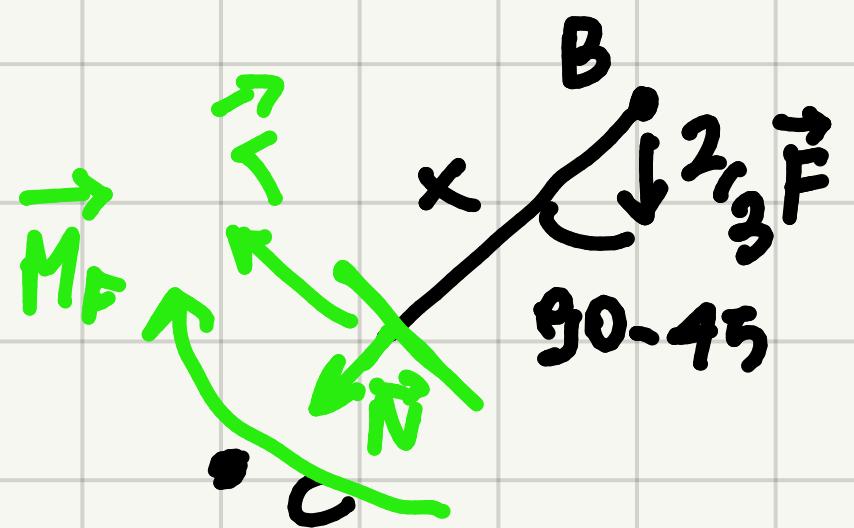


$$H_C = F, V_C = F$$

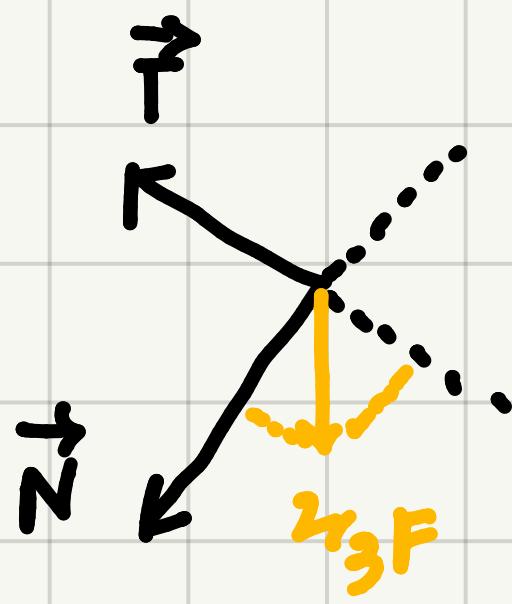


$$K \left\{ \begin{array}{l} N + F \cos(45^\circ) - F_3 \cos(90^\circ - 45^\circ) = 0 \\ T + F \sin(45^\circ) + F_3 \sin(90^\circ - 45^\circ) = 0 \\ M_F + F \times \lambda \sin(45^\circ) + F_3 \times \lambda \sin(90^\circ - 45^\circ) = 0 \end{array} \right.$$

$N = -\frac{\sqrt{2}}{3} F$   
 $T = -2\frac{\sqrt{2}}{3} F$   
 $M_F = -2\frac{\sqrt{2}}{3} F \lambda$   
 $M_F \text{ cos} = 0 \quad M_F \text{ cos} = -\frac{2\sqrt{2}}{3} F \lambda$

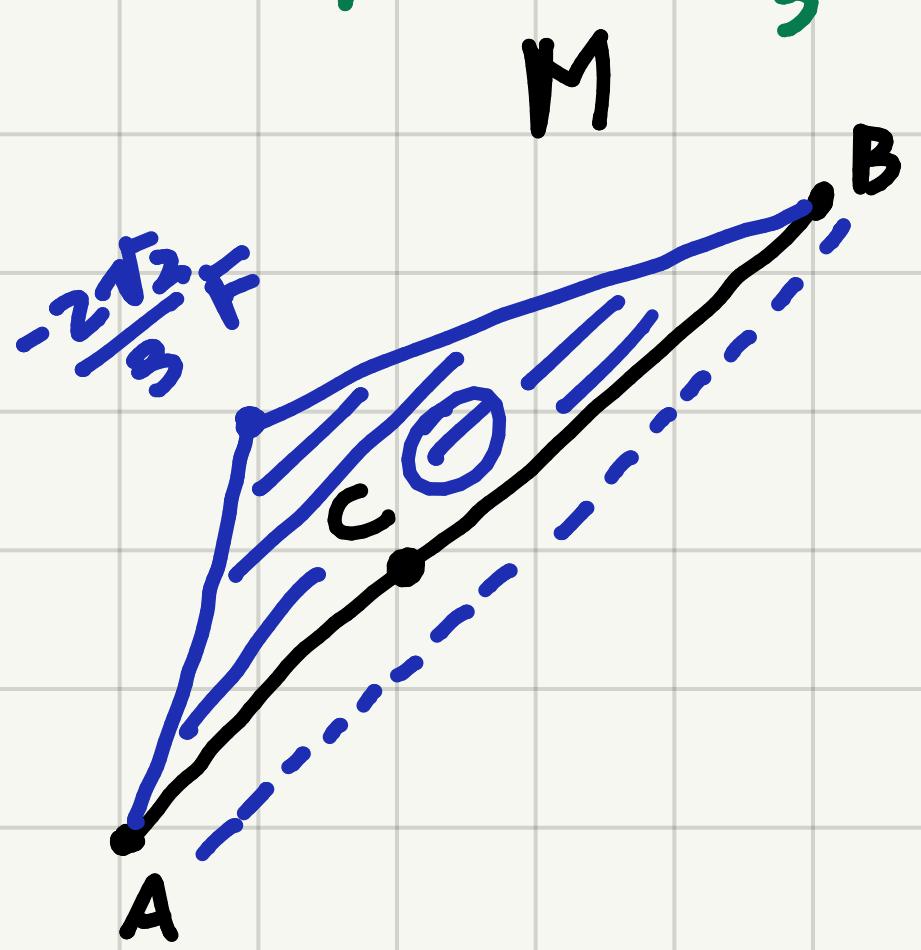
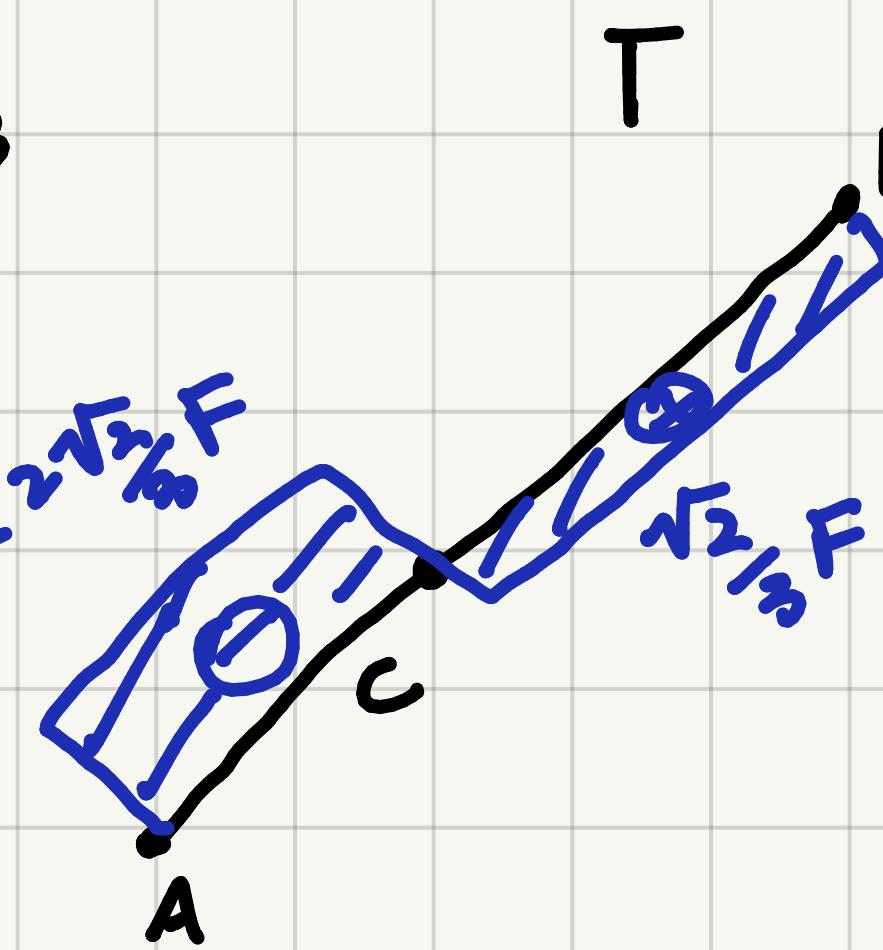
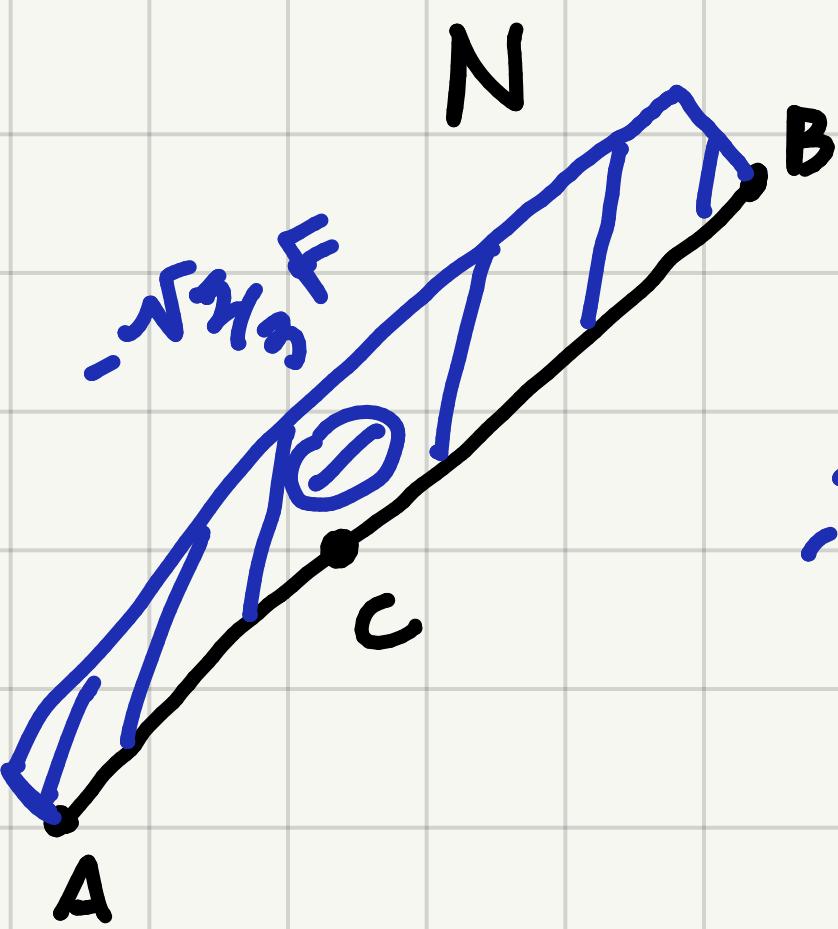


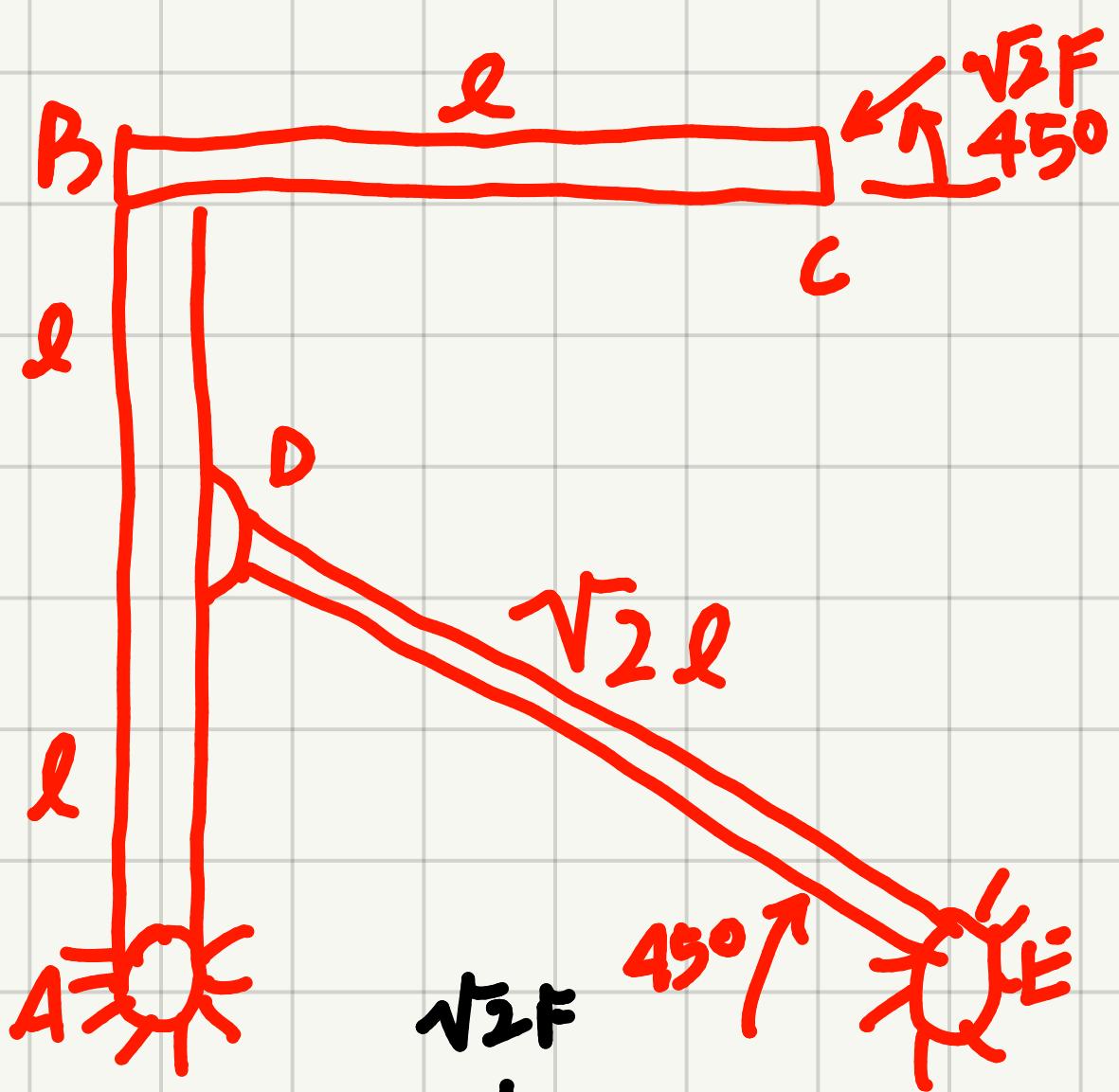
$$0 \leq x \leq 2\lambda$$



$$K \left\{ \begin{array}{l} N + \sqrt{2} F_3 \cos(90^\circ - 45^\circ) = 0 \\ T - \sqrt{2} F_3 \sin(90^\circ - 45^\circ) = 0 \\ -M_F - \sqrt{2} F_3 \times \lambda \sin(90^\circ - 45^\circ) = 0 \end{array} \right.$$

$N = -\sqrt{2} F_3$   
 $T = \sqrt{2} F_3$   
 $M_F = -\frac{\sqrt{2}}{3} F \lambda$   
 $M_F(0) > 0 \quad M_F(2\lambda) = -\frac{2\sqrt{2}}{3} F \lambda$





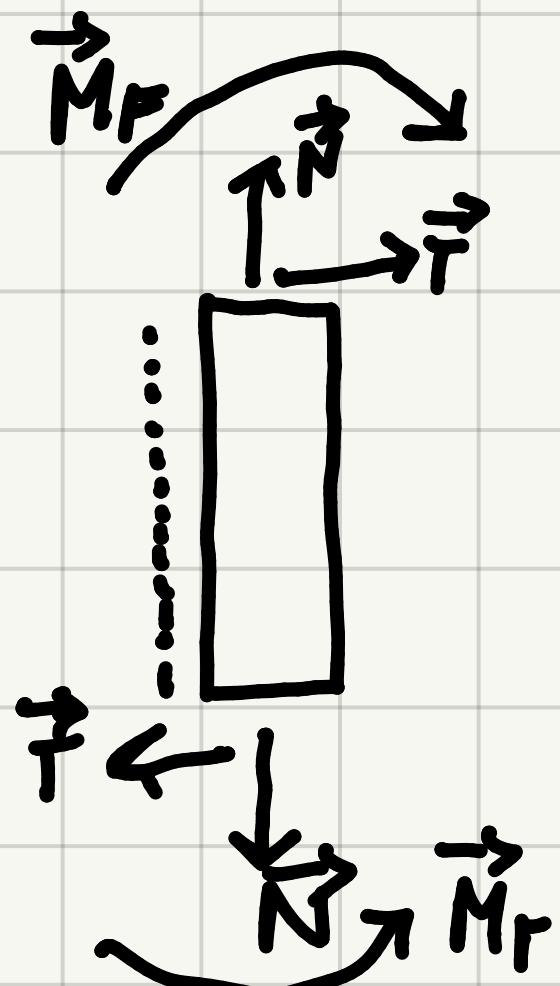
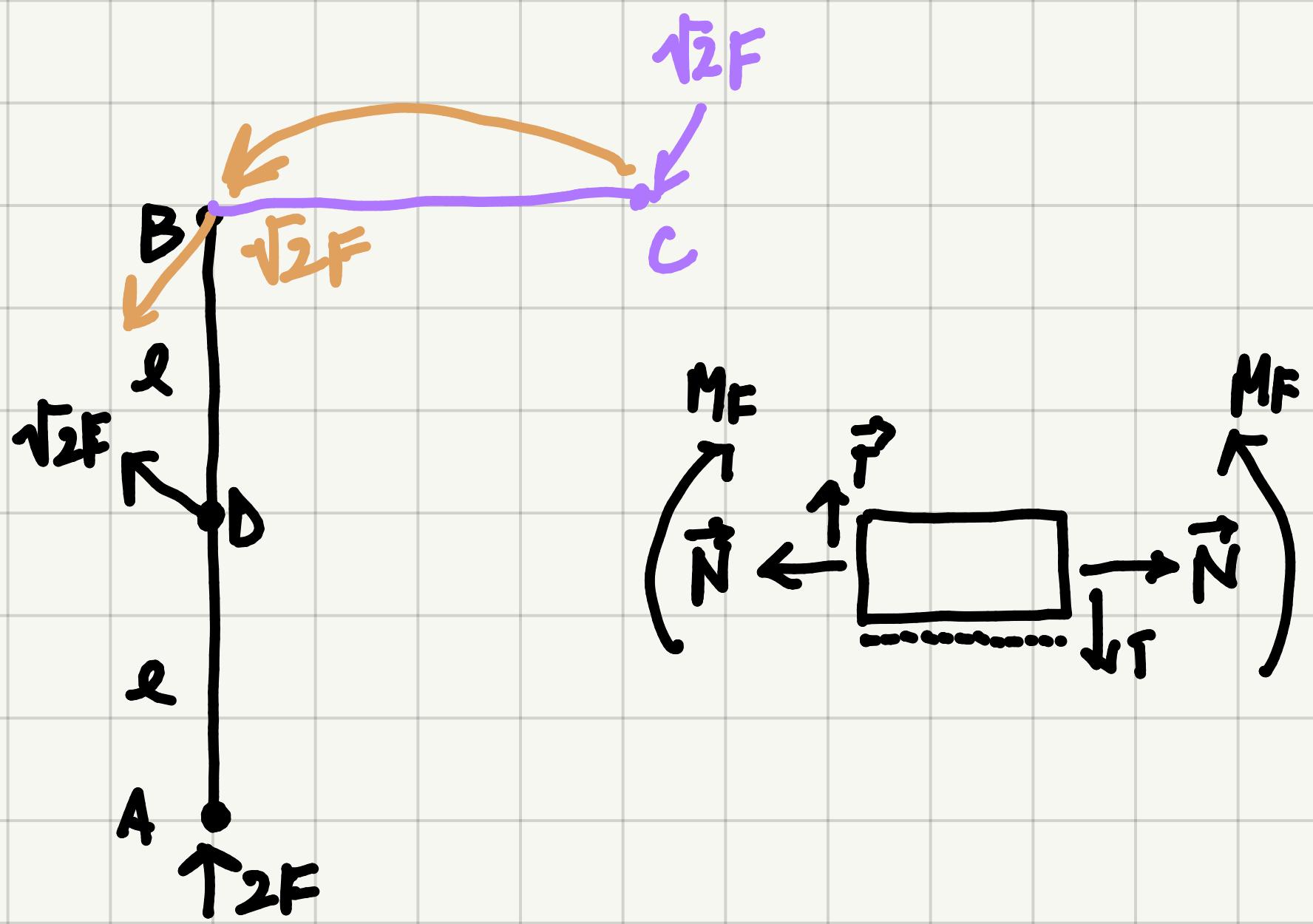
• REAZIONI VINCOLARI A, E, D

• AZIONI INTERNE AB

$$n = 3 \cdot 2 - (2_A + 2_E + 2_D) = 0$$

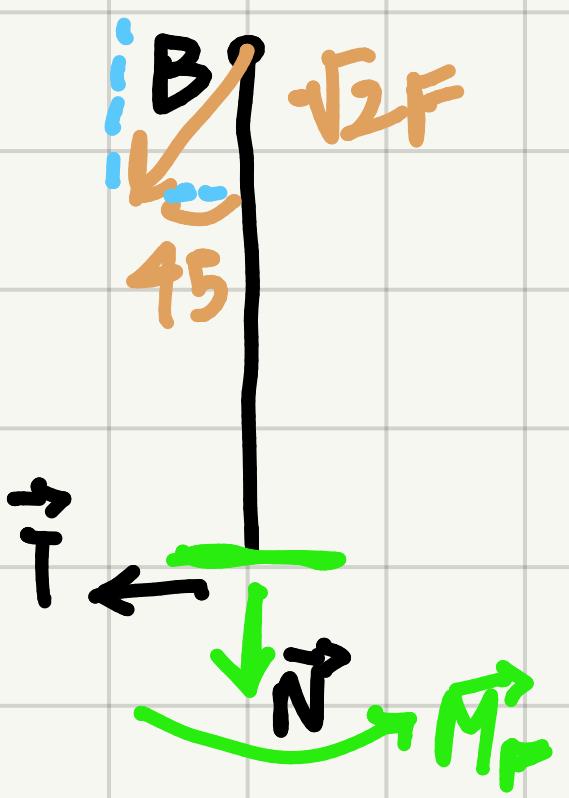
$$\left\{ \begin{array}{l} H_A + R_E \cos(45) - \sqrt{2}F \cos(45) = 0 \\ V_A - R_E \sin(45) - \sqrt{2}F \sin(45) = 0 \\ -R_E \sin(90+45) + \sqrt{2}F \sin(45) = 0 \end{array} \right.$$

$$\left\{ \begin{array}{l} H_A = 0 \\ V_A = 2F \\ R_E = \sqrt{2}F \end{array} \right. \quad R_D = \sqrt{2}F$$

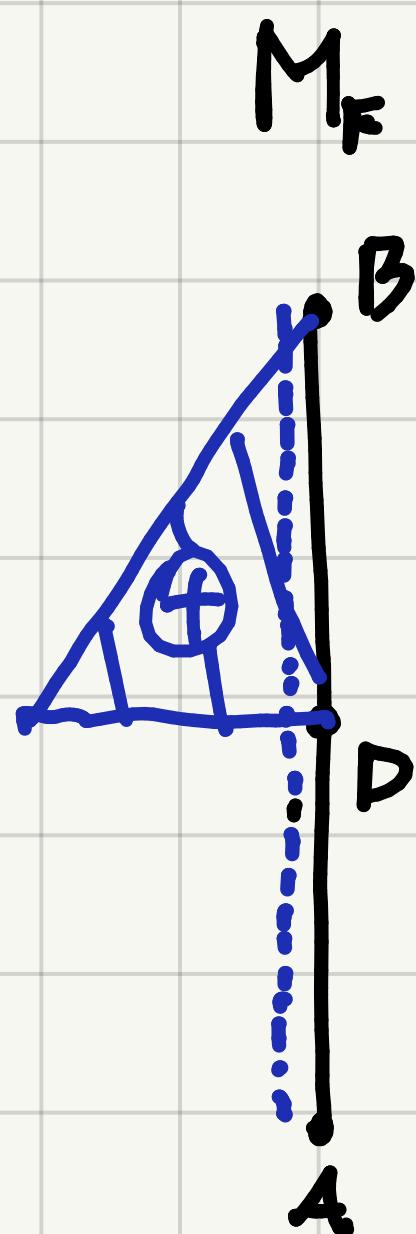
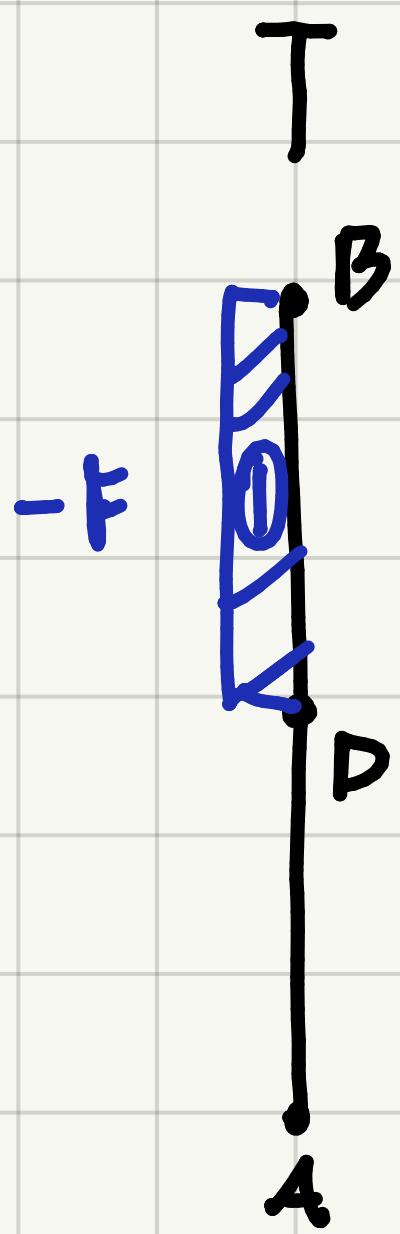
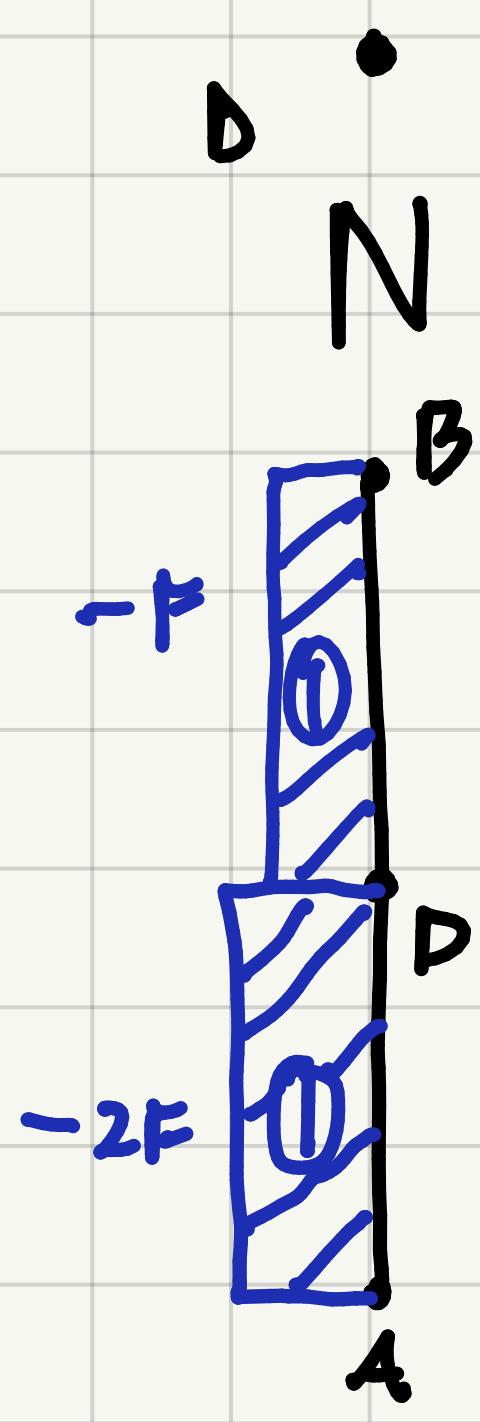


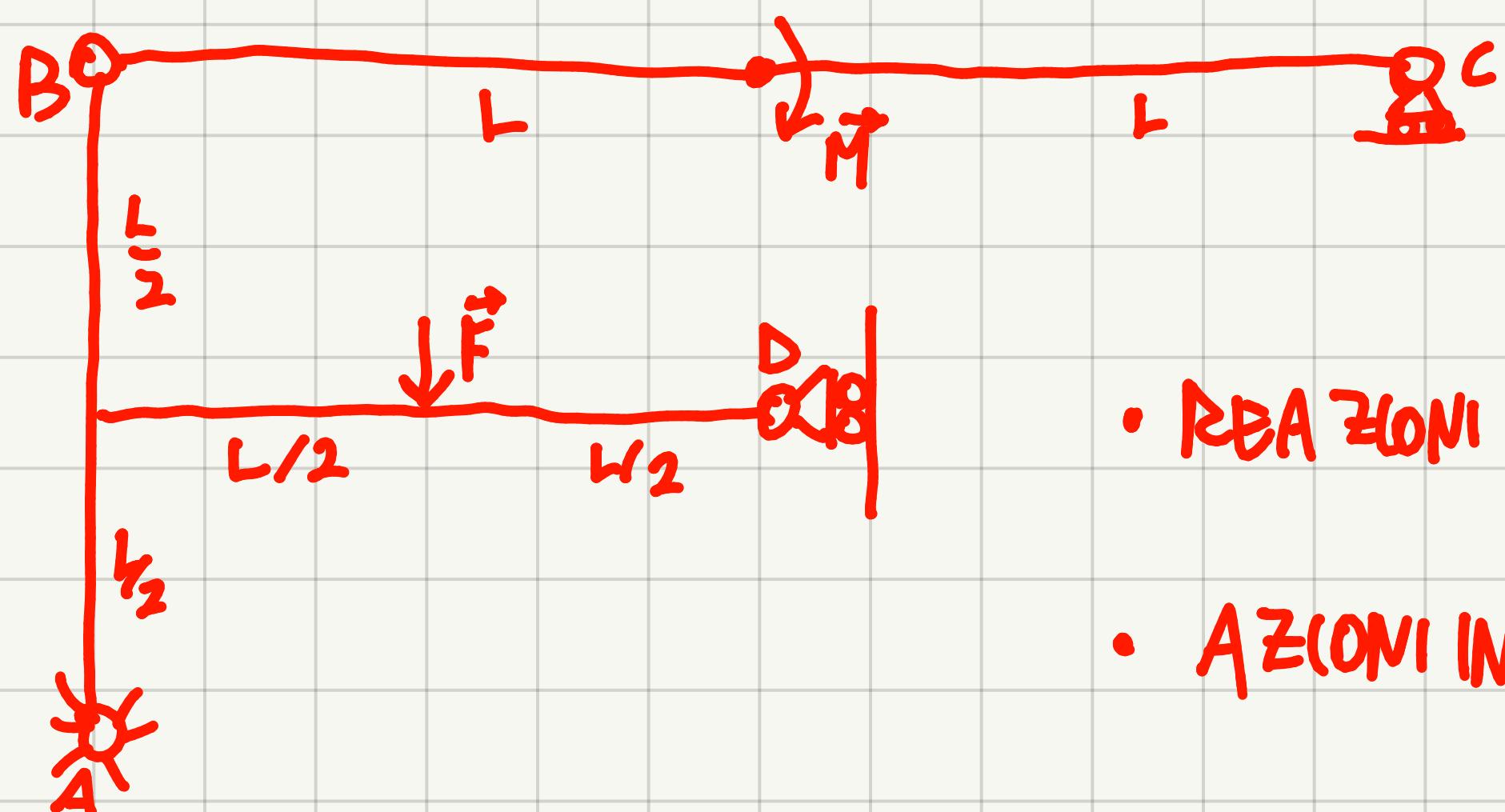
$$\left\{ \begin{array}{l} N + 2F = 0 \\ T = 0 \\ -M_F = 0 \end{array} \right.$$

$$N = -2F$$



$$\begin{cases} N + \sqrt{2}F \cos(45^\circ) = 0 & N = -F \\ -T + \sqrt{2}F \sin(45^\circ) = 0 & T = -F \\ M_F - \sqrt{2}F \times 2M(45^\circ) = 0 & M_F(0) = 0 \\ M_F(2) = F\ell & M_F(\ell) = F\ell \end{cases}$$

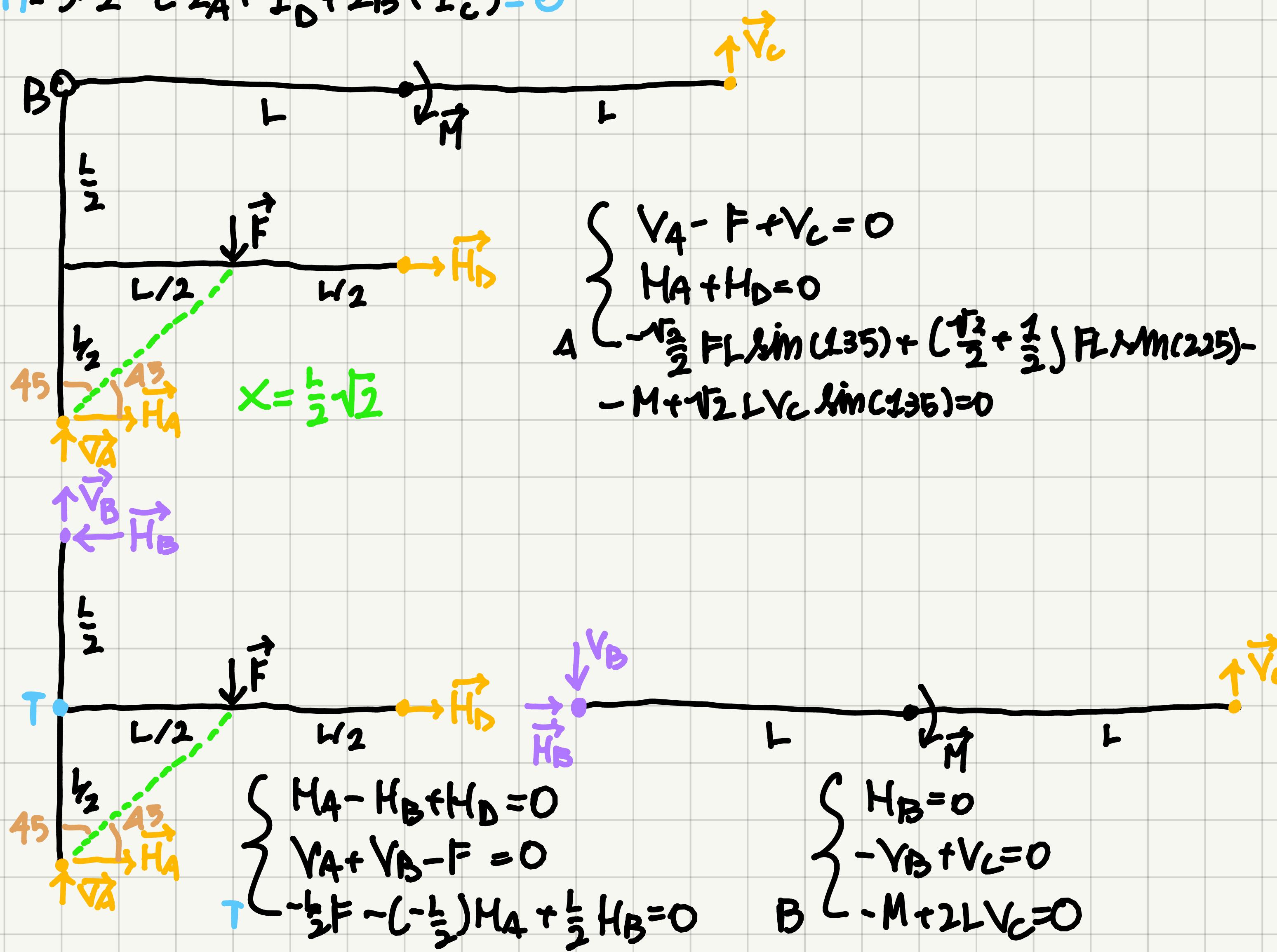




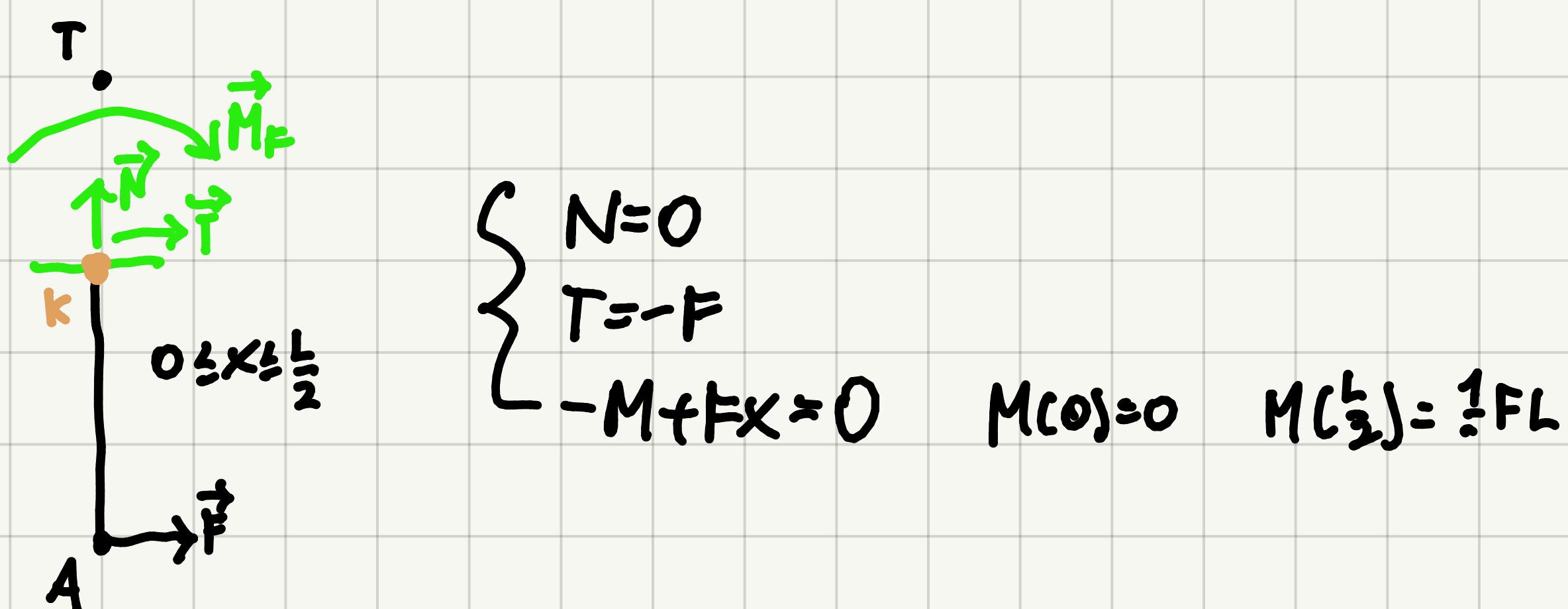
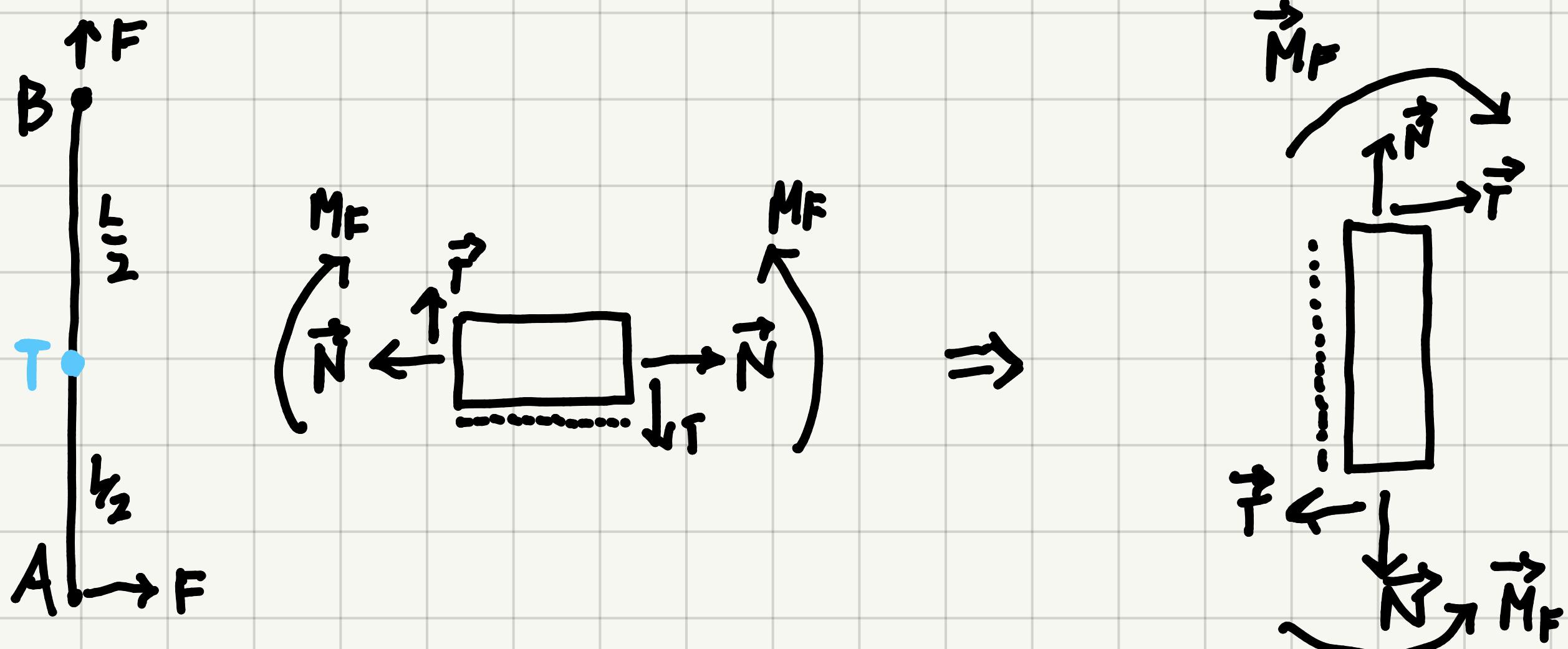
$$M = 2FL$$

- RBA ZIONI VINCOLARI A, B, C, D
- AZIONI INTERNE  $\bar{AB}$

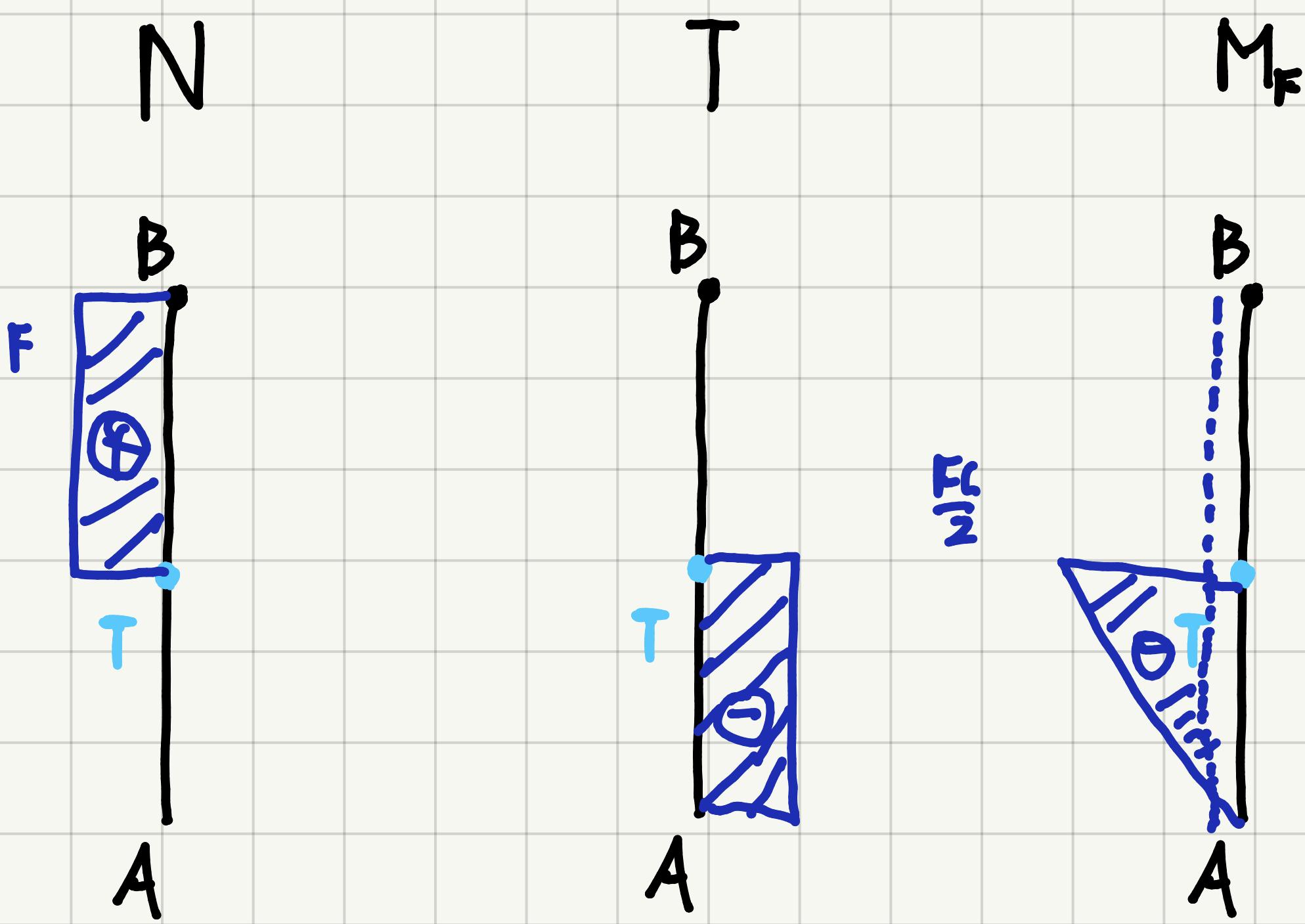
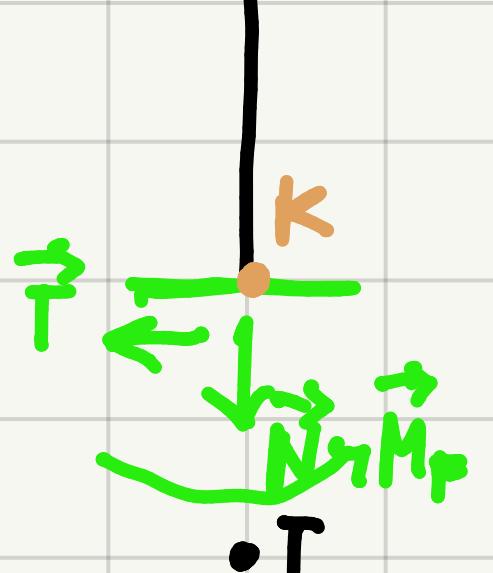
$$n = 3 \cdot 2 - (2_A + 1_D + 2_B + 1_C) = 0$$

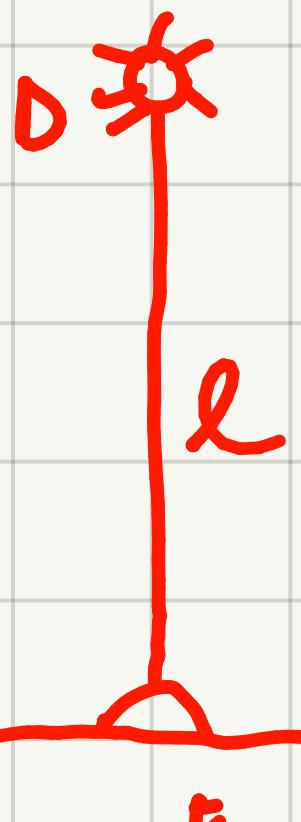


$$\left\{ \begin{array}{l} H_D = -F \\ V_A = 0 \\ H_A = F \\ H_B = 0 \\ V_B = F \\ V_C = F \end{array} \right.$$

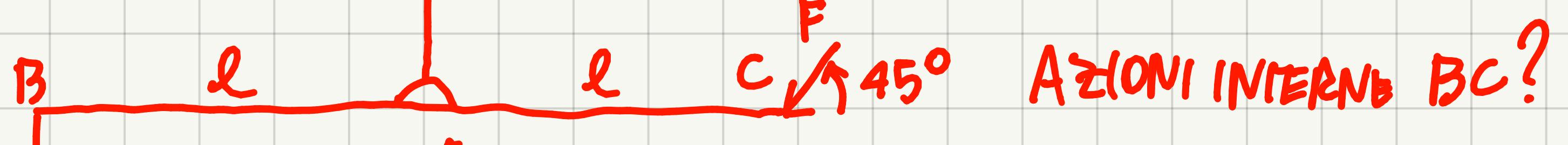


$$\left\{ \begin{array}{l} N=F \\ T=0 \\ M_F=0 \end{array} \right.$$

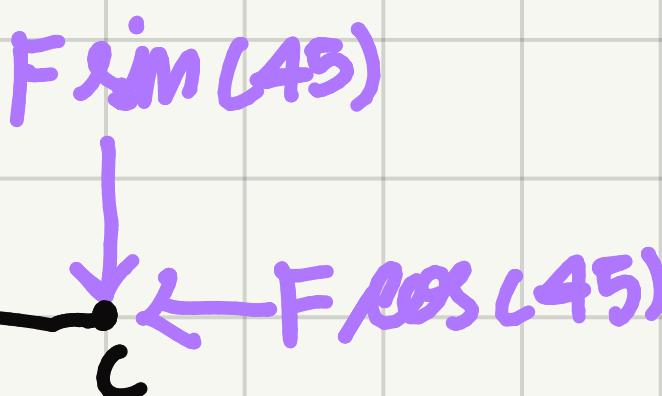




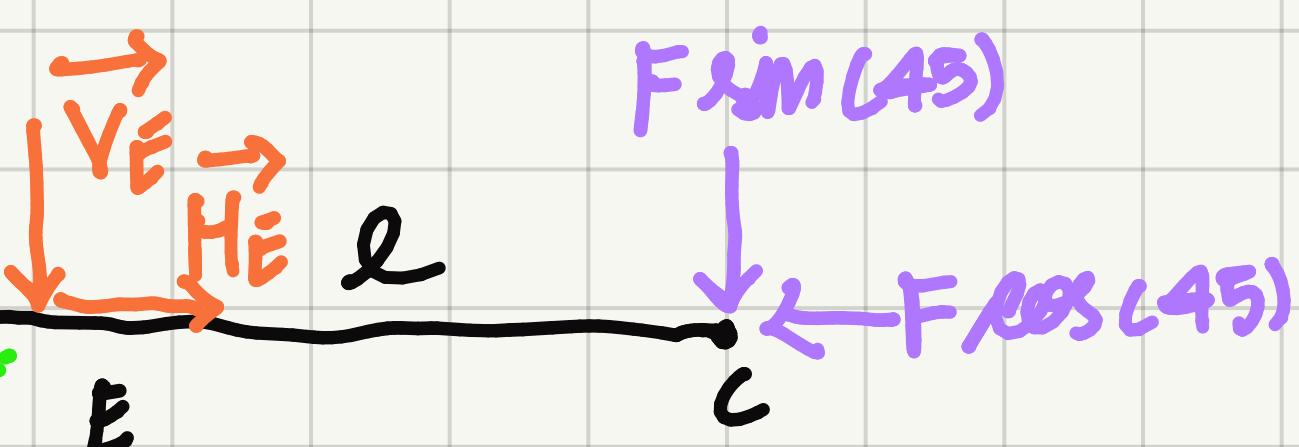
REAZIONI VINCOLARI A, E, D?



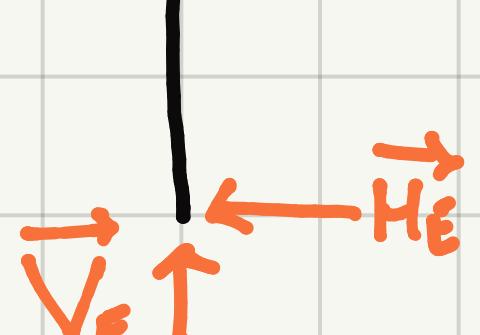
$$n = 3 \cdot 2 - (2_A + 2_D + 2_E) = 0$$



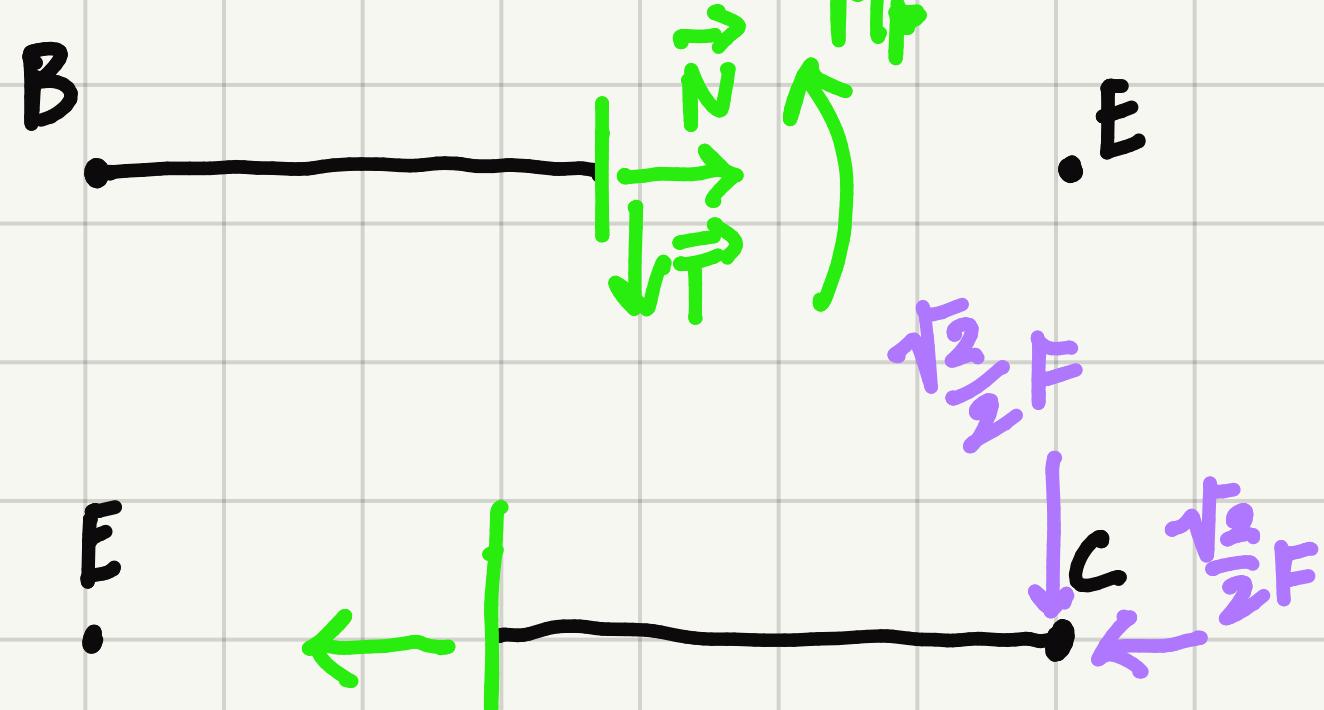
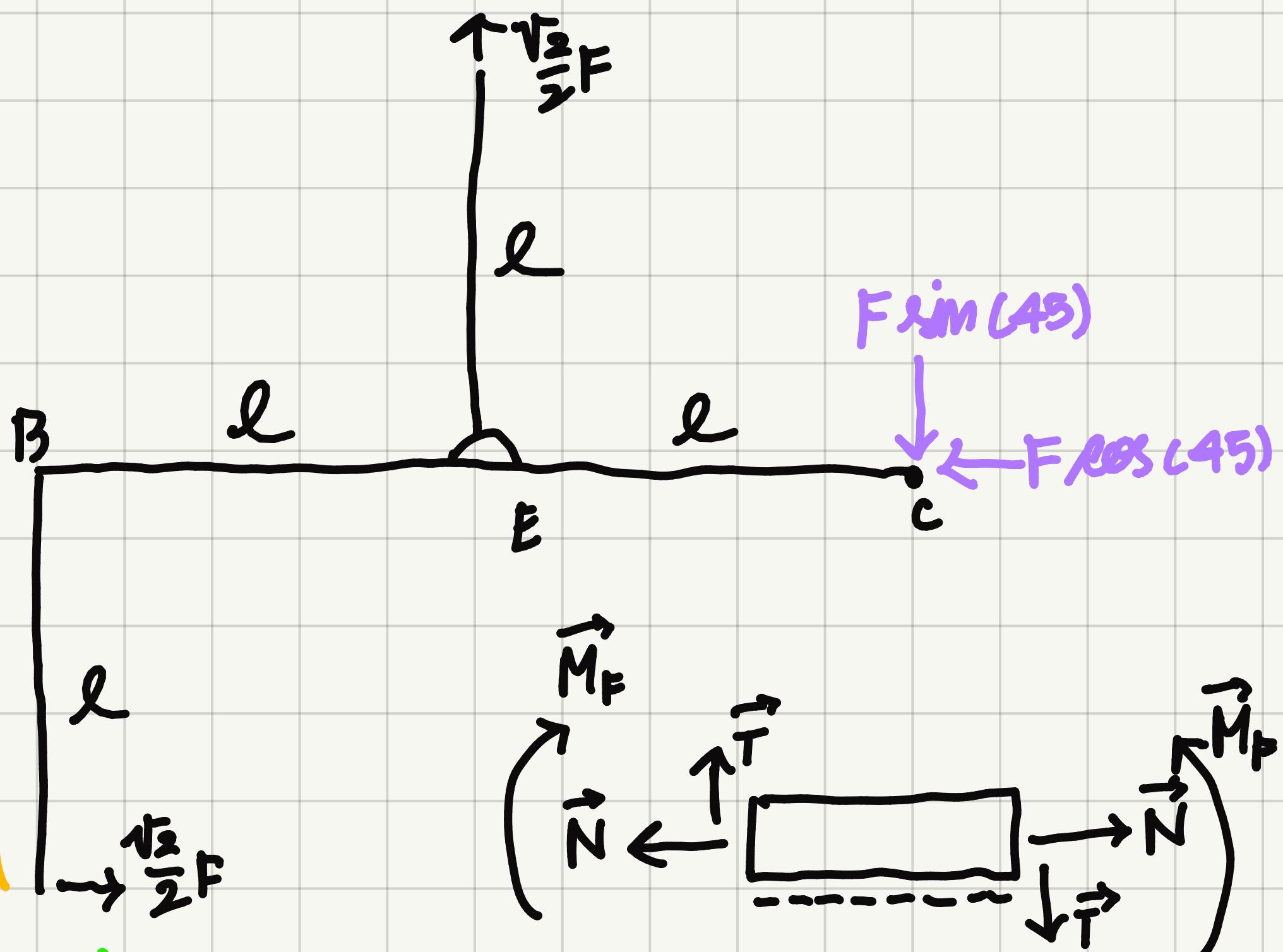
$$\begin{cases} H_A + H_D - F \cos(45) = 0 \\ V_A - V_D - F \sin(45) = 0 \\ E - H_D l - F \sin(45) = 0 \end{cases}$$



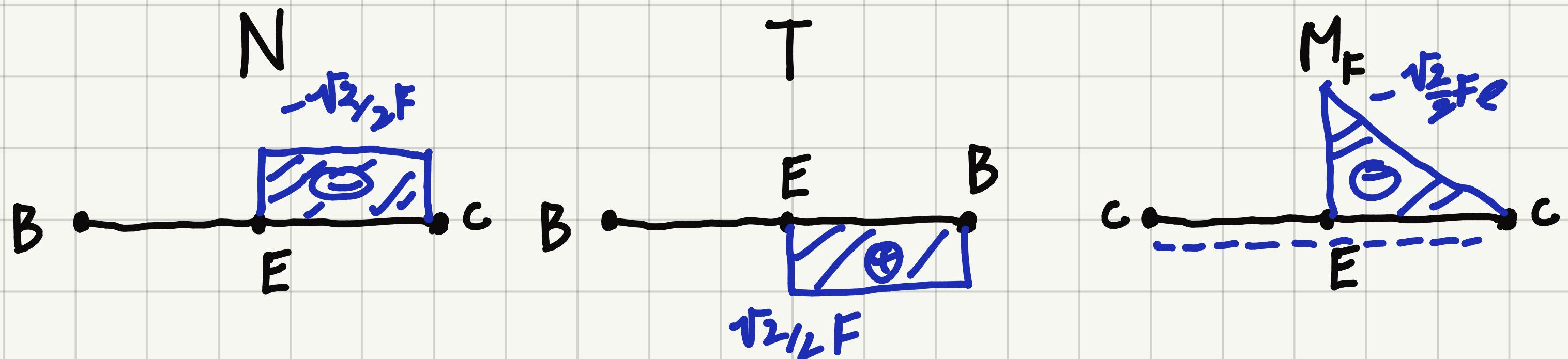
$$\begin{cases} V_A - V_E - F \sin(45) = 0 \\ H_A + H_E - F \cos(45) = 0 \\ B - (H_A \ell) - V_E \ell - 2F \ell \sin(45) = 0 \\ \begin{cases} H_E - H_D = 0 \\ V_E - V_D = 0 \\ E - H_D \ell = 0 \end{cases} \end{cases}$$

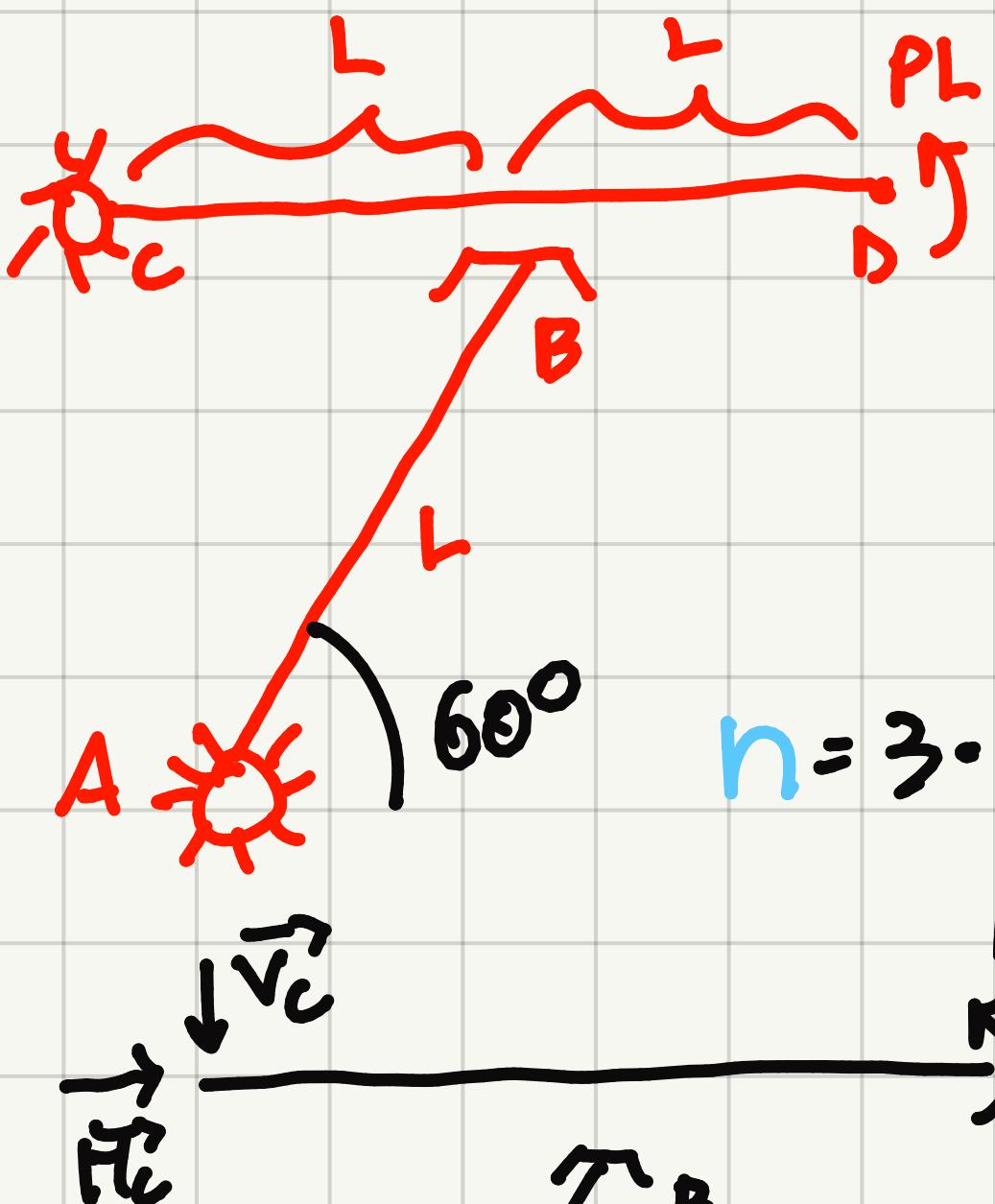


$$\left\{ \begin{array}{l} V_A = 0 \\ H_A = \sqrt{2}/2F \\ V_E = -\sqrt{2}/2F \\ H_E = 0 \\ V_D = -\sqrt{2}/2F \\ H_D = 0 \end{array} \right.$$



$$\left\{ \begin{array}{l} N=0 \\ T=0 \\ M=0 \\ -N - \frac{\sqrt{2}}{2}F = 0 \\ T - \frac{\sqrt{2}}{2}F = 0 \\ -M - \frac{\sqrt{2}}{2} \times F = 0 \end{array} \right. \quad \left. \begin{array}{l} N = -\frac{\sqrt{2}}{2}F \\ T = \frac{\sqrt{2}}{2}F \\ M(0) = 0 \quad M(l/2) = -\frac{\sqrt{2}}{2}Fl \end{array} \right.$$



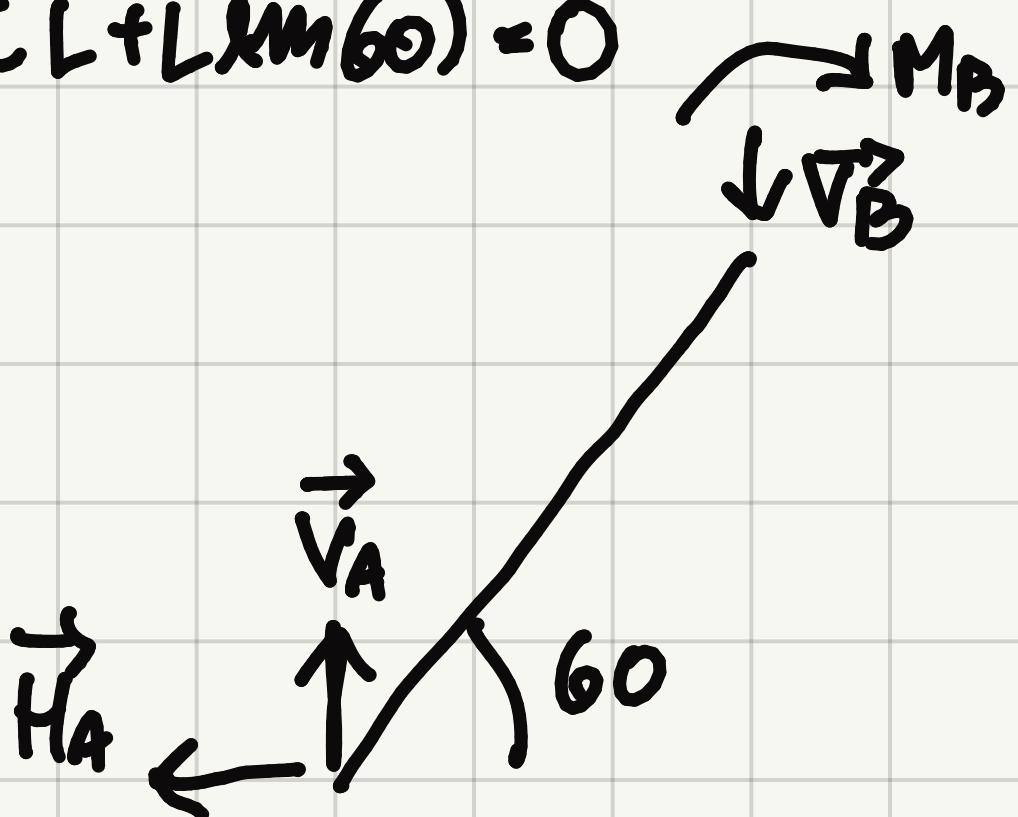
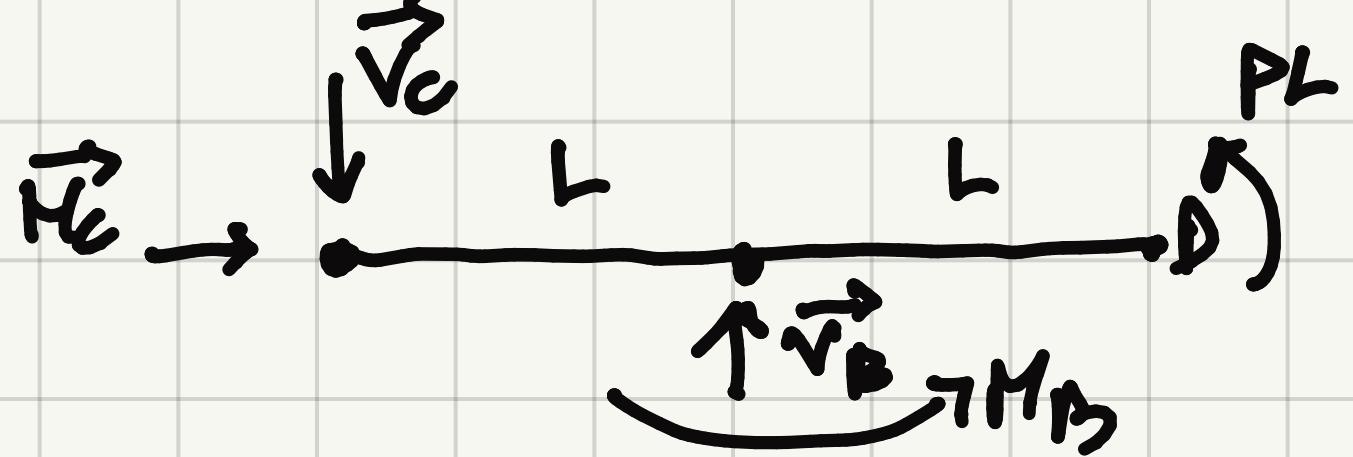


• REAZIONI VINCOLARI A, B, C?

• AZIONI INTERNE CD?

$$n = 3 \cdot 2 - (2_A + 2_B + 2_C) = 0$$

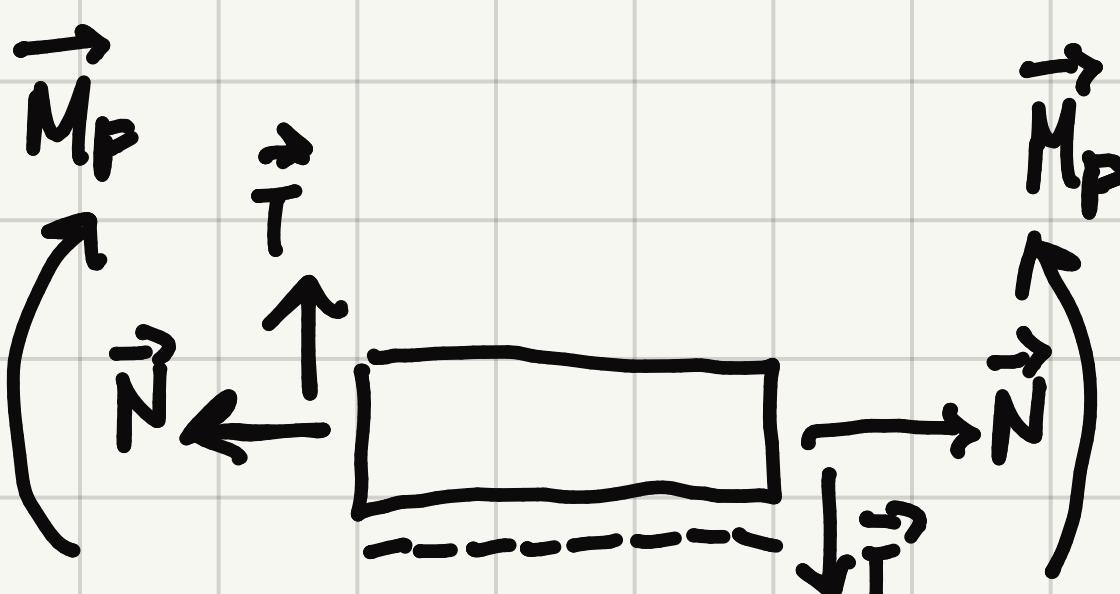
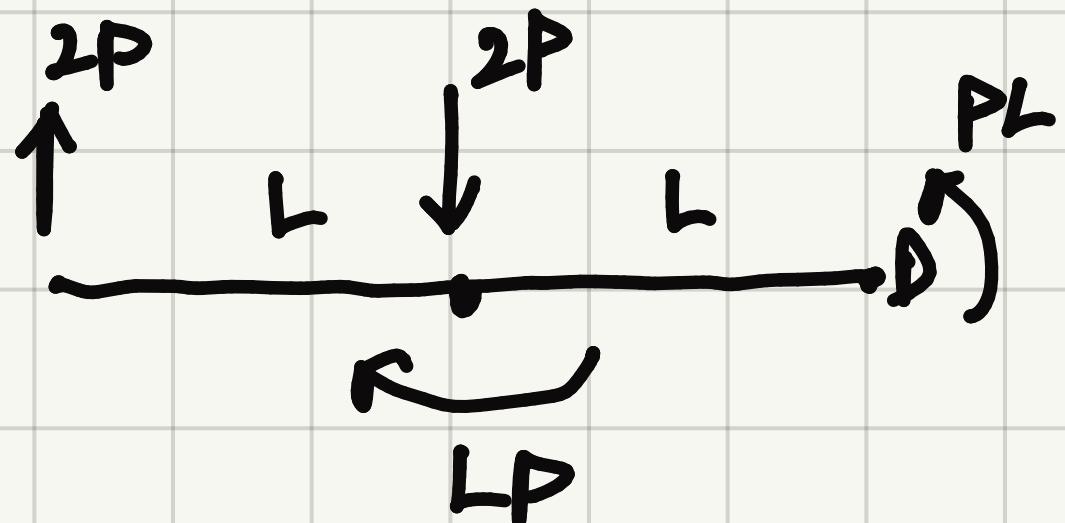
$$\begin{cases} H_C - H_A = 0 \\ -V_C + V_A = 0 \\ PL + V_C (L + L \sin 60^\circ) = 0 \end{cases}$$

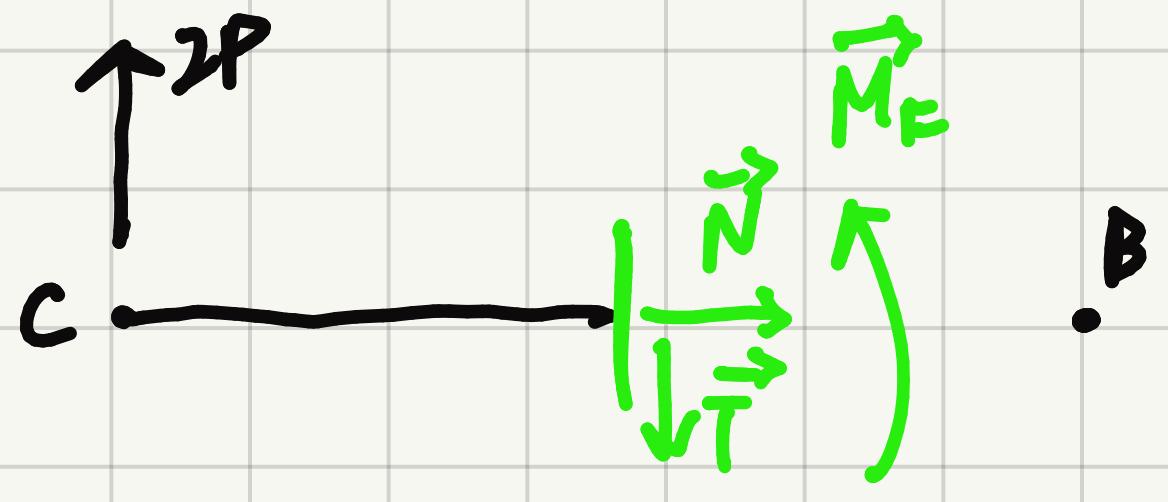


$$\begin{cases} H_C = 0 \\ -V_C + V_B = 0 \\ M_B + V_B L + PL = 0 \end{cases}$$

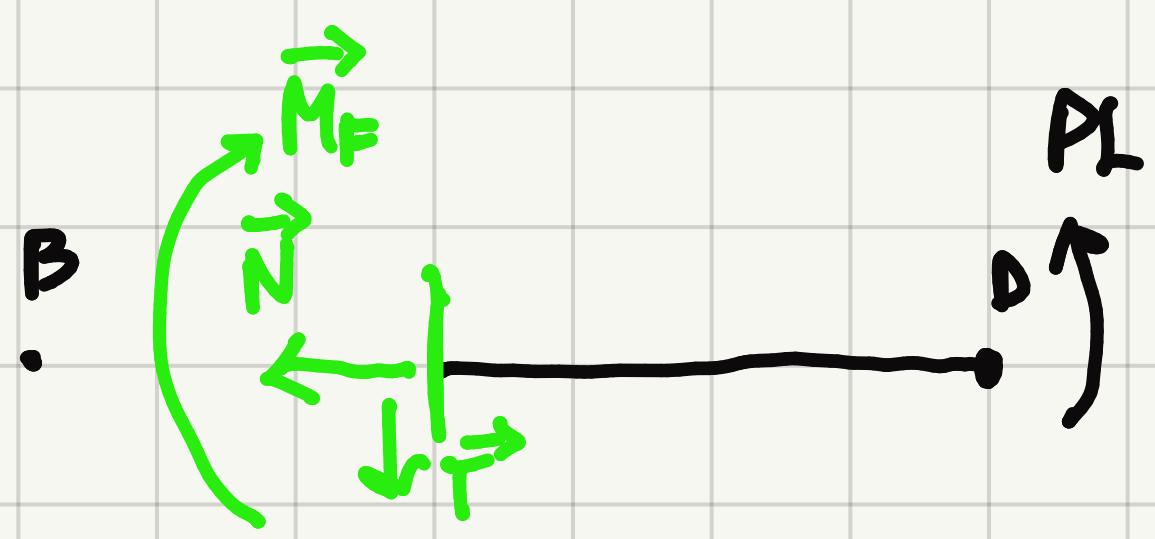
$$\begin{cases} H_A = 0 \\ V_A - V_B = 0 \\ -V_B L \sin(30^\circ) + M_B = 0 \end{cases}$$

$$\begin{cases} H_C = 0 \\ V_C = -2P \\ V_B = -2P \\ H_A = 0 \\ V_A = -2P \\ M_B = -LP \end{cases}$$

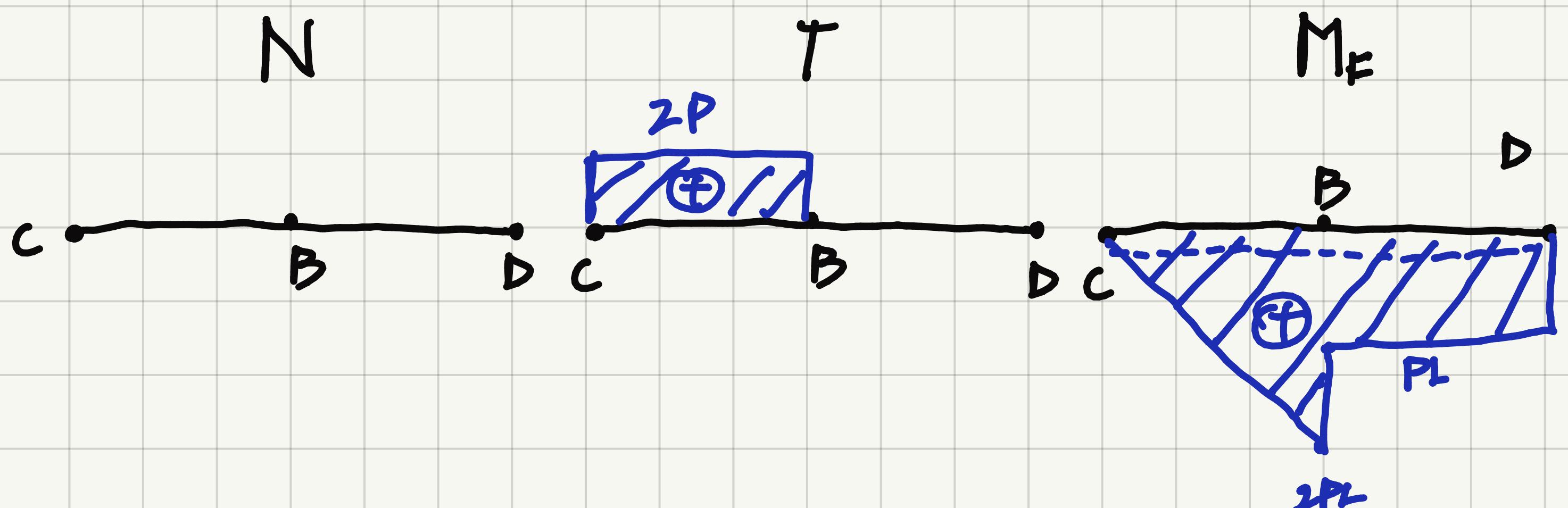


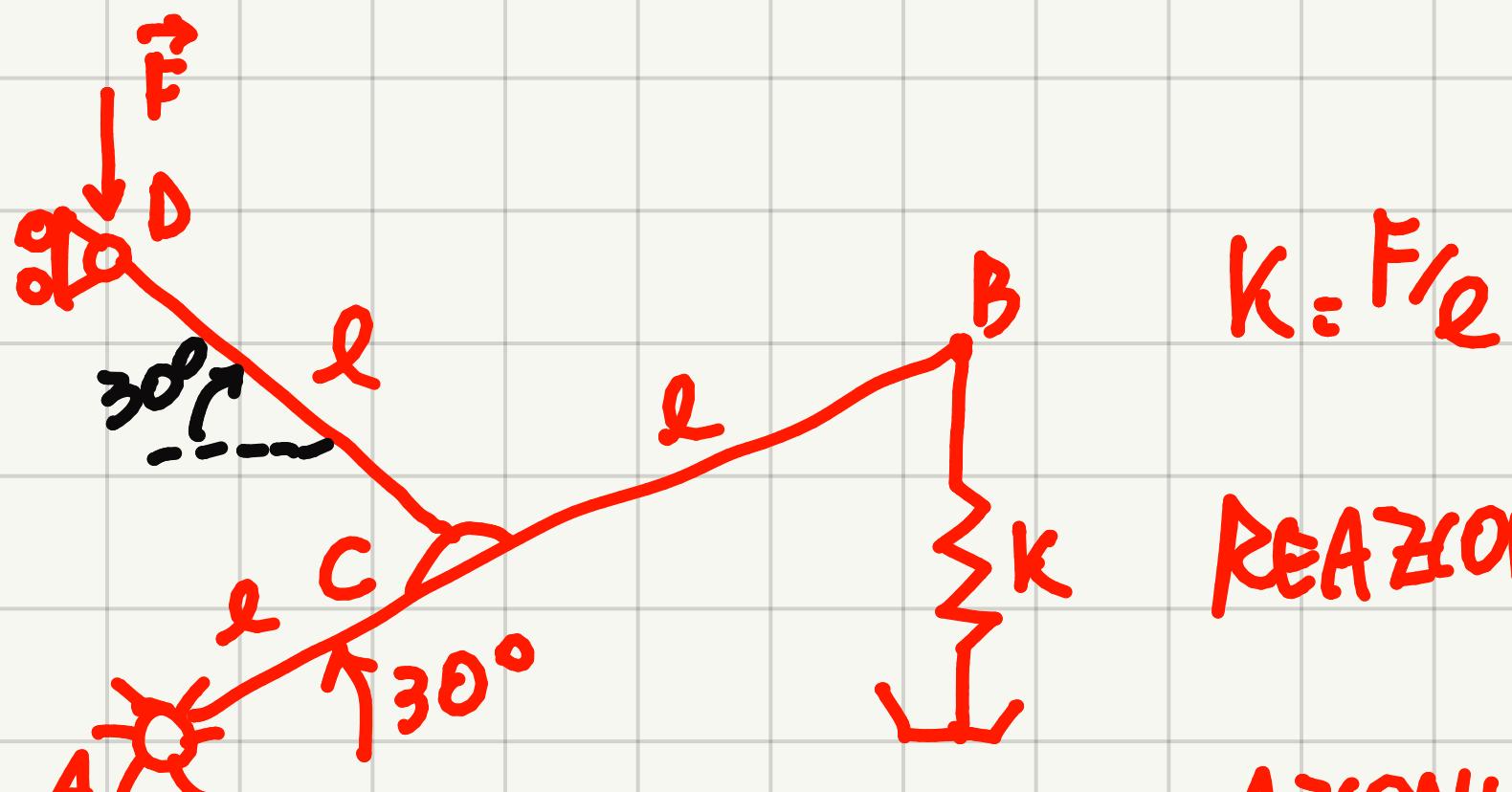


$$\left\{ \begin{array}{l} N=0 \\ T=2P \\ M_F=2Px \quad M_F(0)=0 \quad M_F(L)=2PL \end{array} \right.$$



$$\left\{ \begin{array}{l} N=0 \\ T=0 \\ M_F=PL \end{array} \right.$$

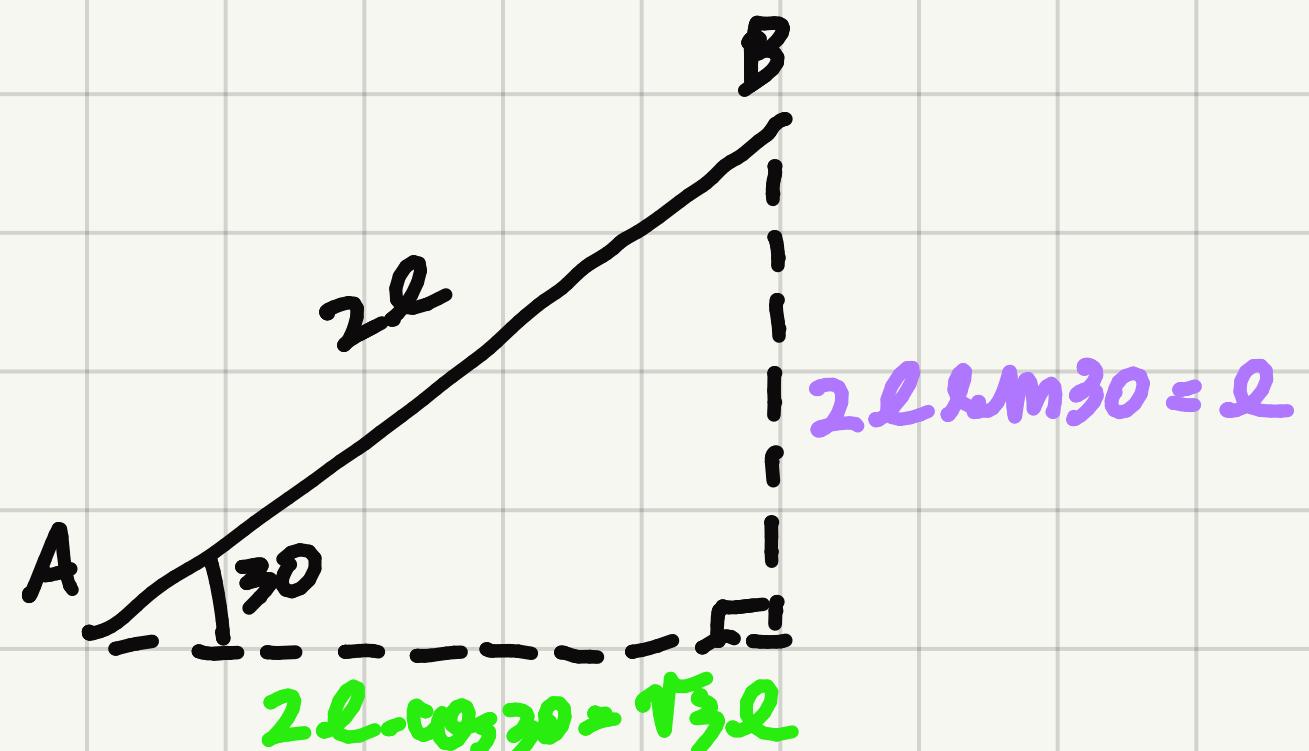
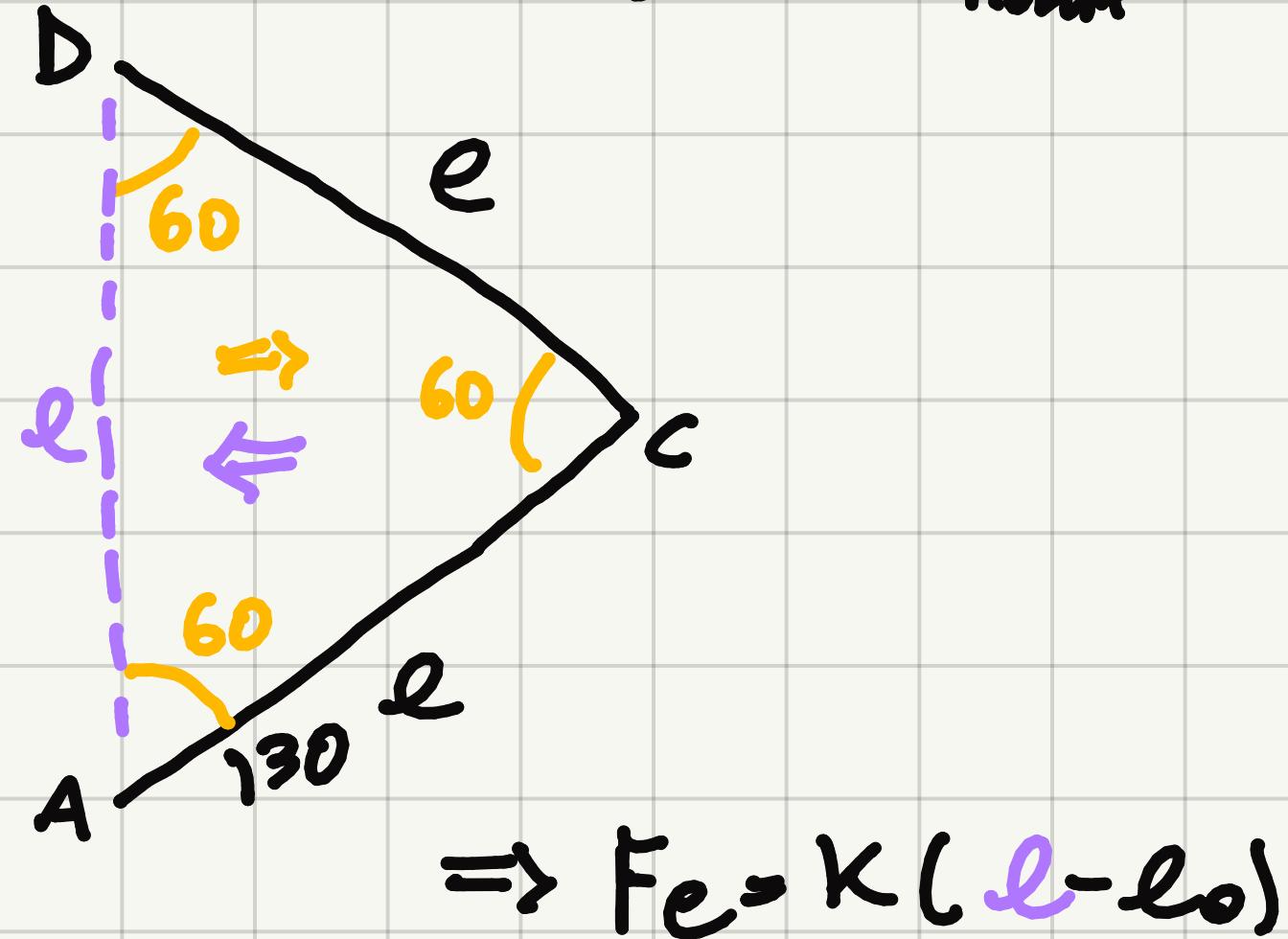




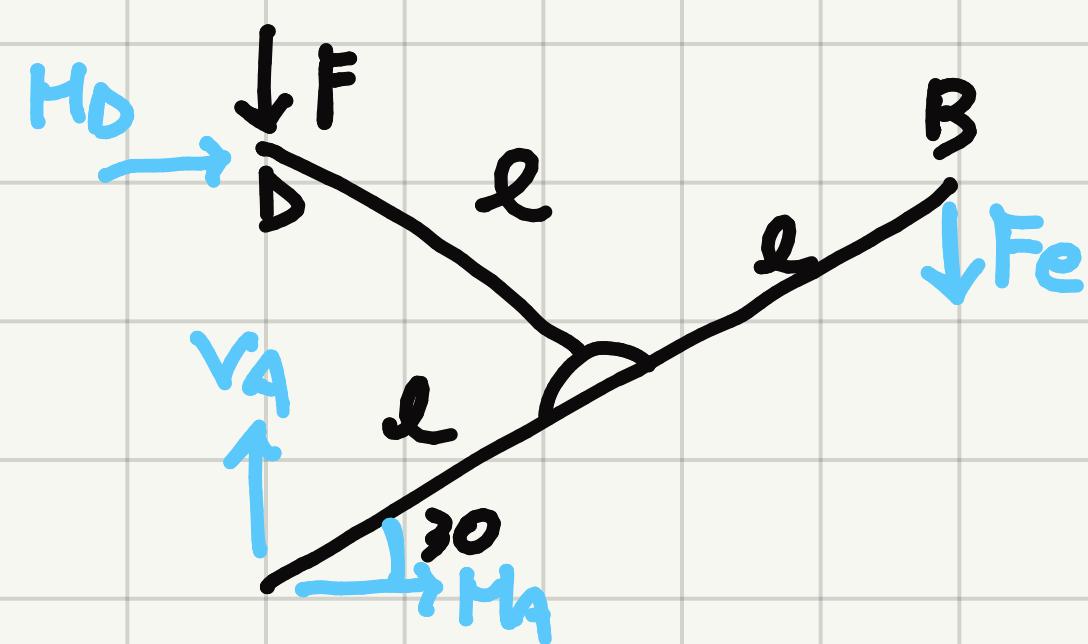
# REAZIONI VINCOLARI A, B, C, D?

# AZIONI INTERNE AB? $\ell_0$ ?

$$h = 3 \cdot 2 - (2_A + 2_C + 1_D + 1_{\text{MONA}}) = 0$$



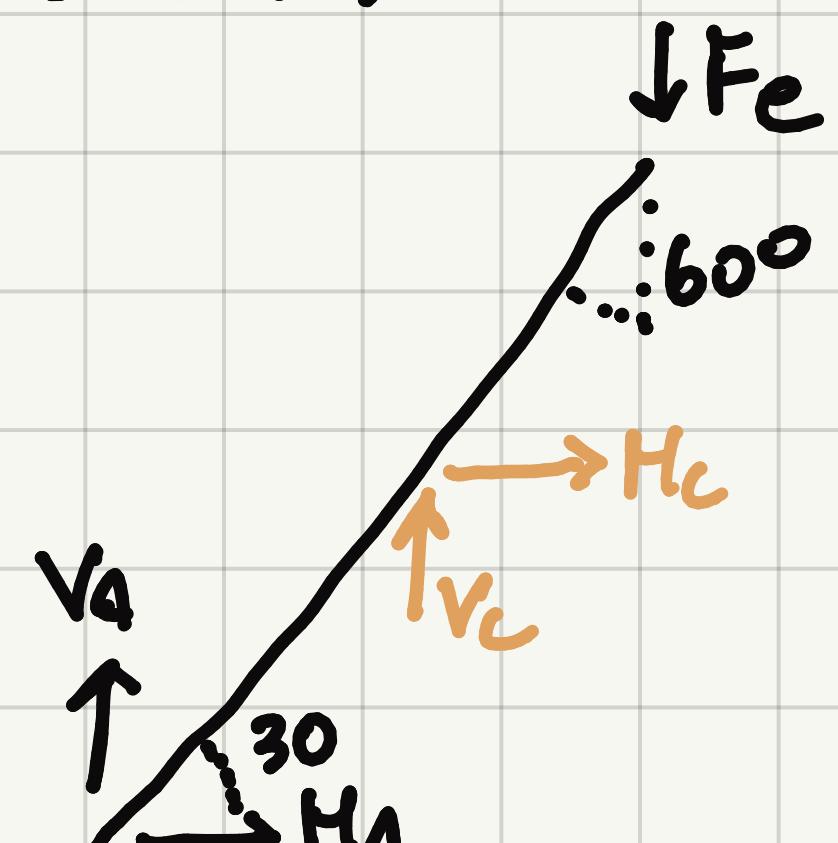
$$\Rightarrow F_e = K(\ell - \ell_0)$$



$$\left\{ \begin{array}{l} H_A + H_D = 0 \\ -F - F_C + V_A = 0 \\ H_D l + F_C 2l \sin(90 - 30) = 0 \end{array} \right.$$

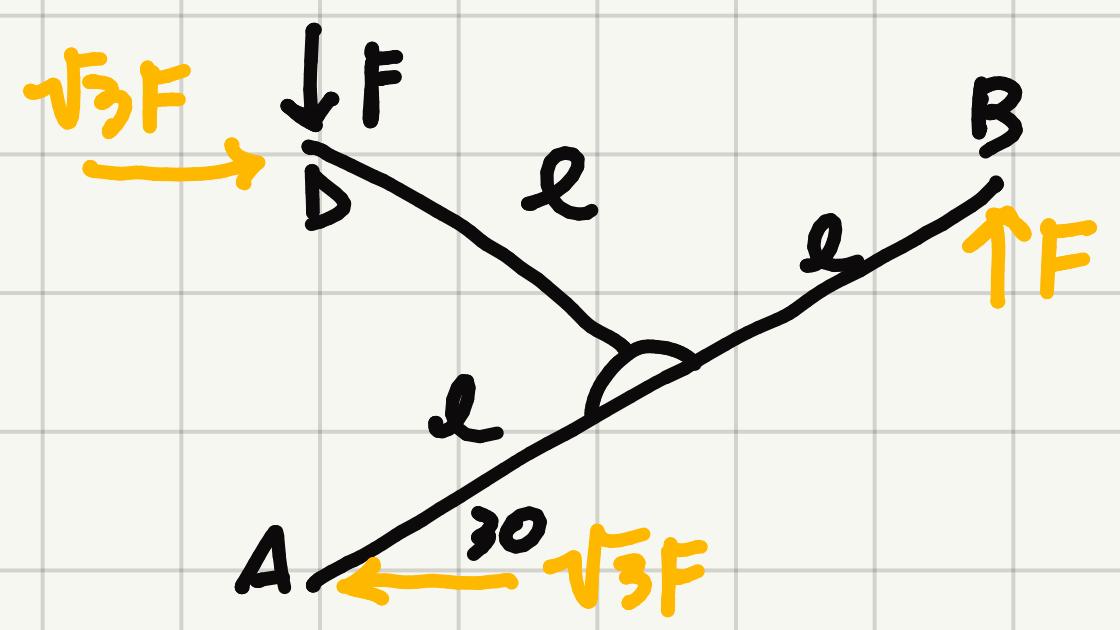


$$\left\{ \begin{array}{l} H_D - H_C = 0 \\ -F - V_C = 0 \\ D \quad lH_C \sin(30) + lV_C \cos(30) = 0 \end{array} \right.$$



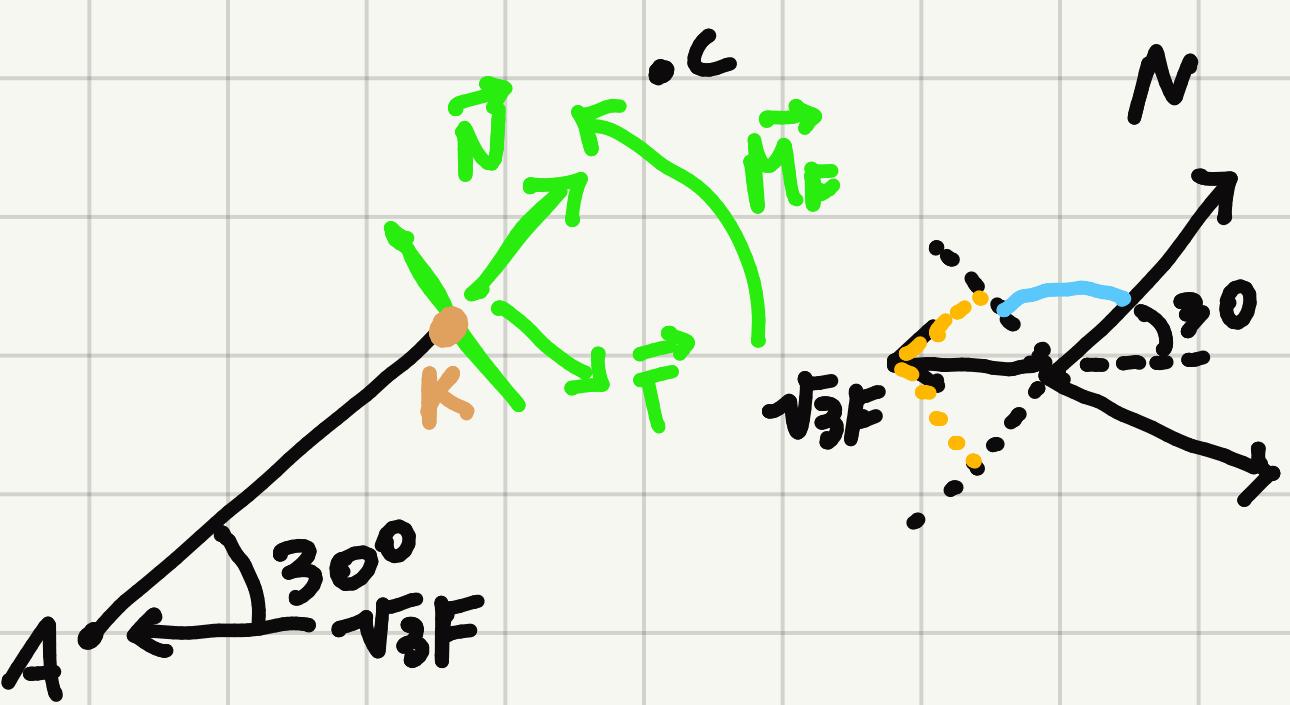
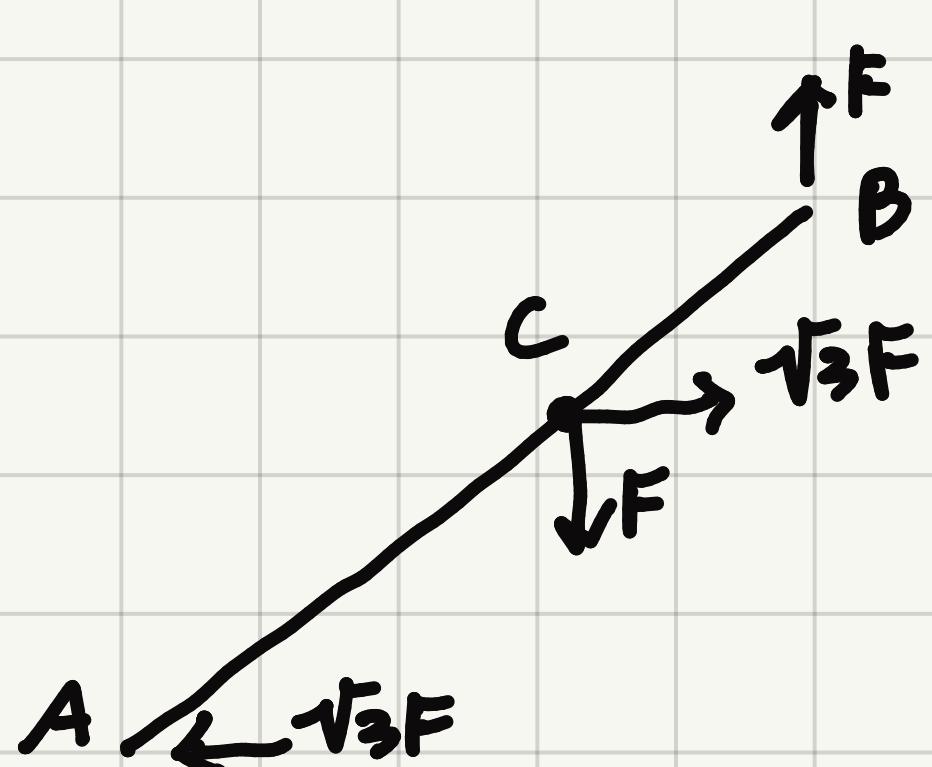
$$\left. \begin{array}{l} H_A + H_C = 0 \\ V_A + V_C - F_e = 0 \\ H_C \sin(30^\circ) + V_C \cos(30^\circ) \\ - F_e \sin(60^\circ) = 0 \end{array} \right\}$$

$$\left. \begin{array}{l} M_D = -\sqrt{3}F \\ V_C = -F \\ M_C = \sqrt{3}F \\ M_A = -\sqrt{3}F \\ V_A = F + F_C \\ -\sqrt{3/2}F_L - \sqrt{3/2}F_L - \sqrt{3}F_L = 0 \\ F_C = -F \end{array} \right\} V_A = 0$$



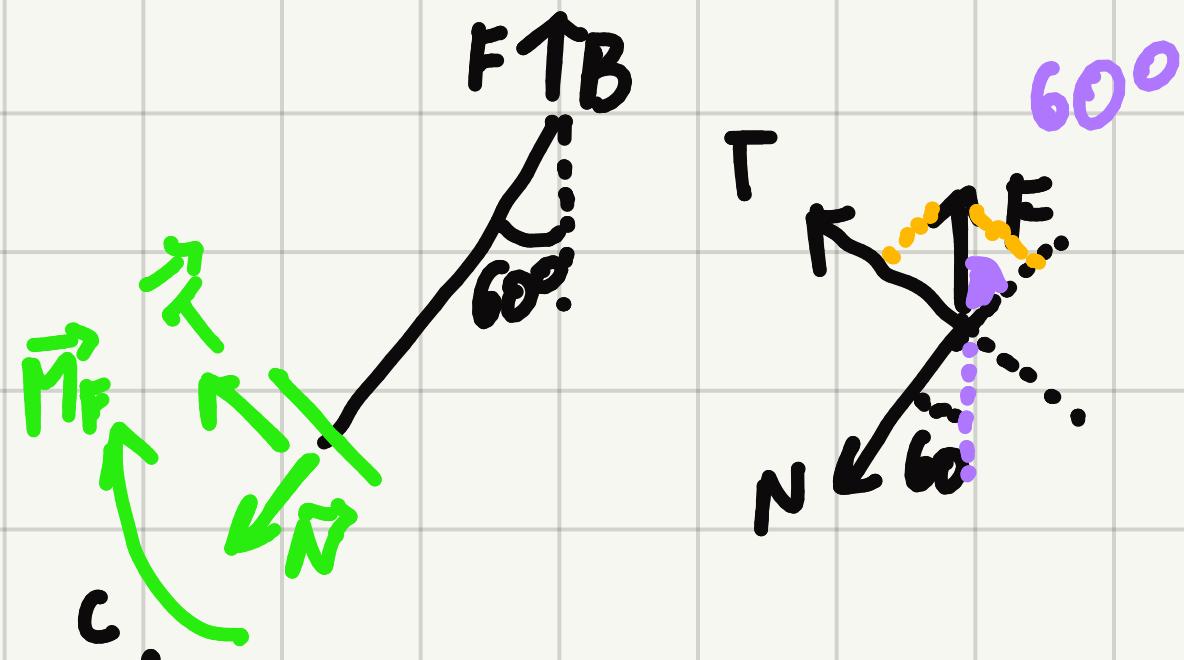
$$-l = K(l - l_0) = \frac{F}{2}(l - l_0)$$

$$\Rightarrow l_0 = 2l$$



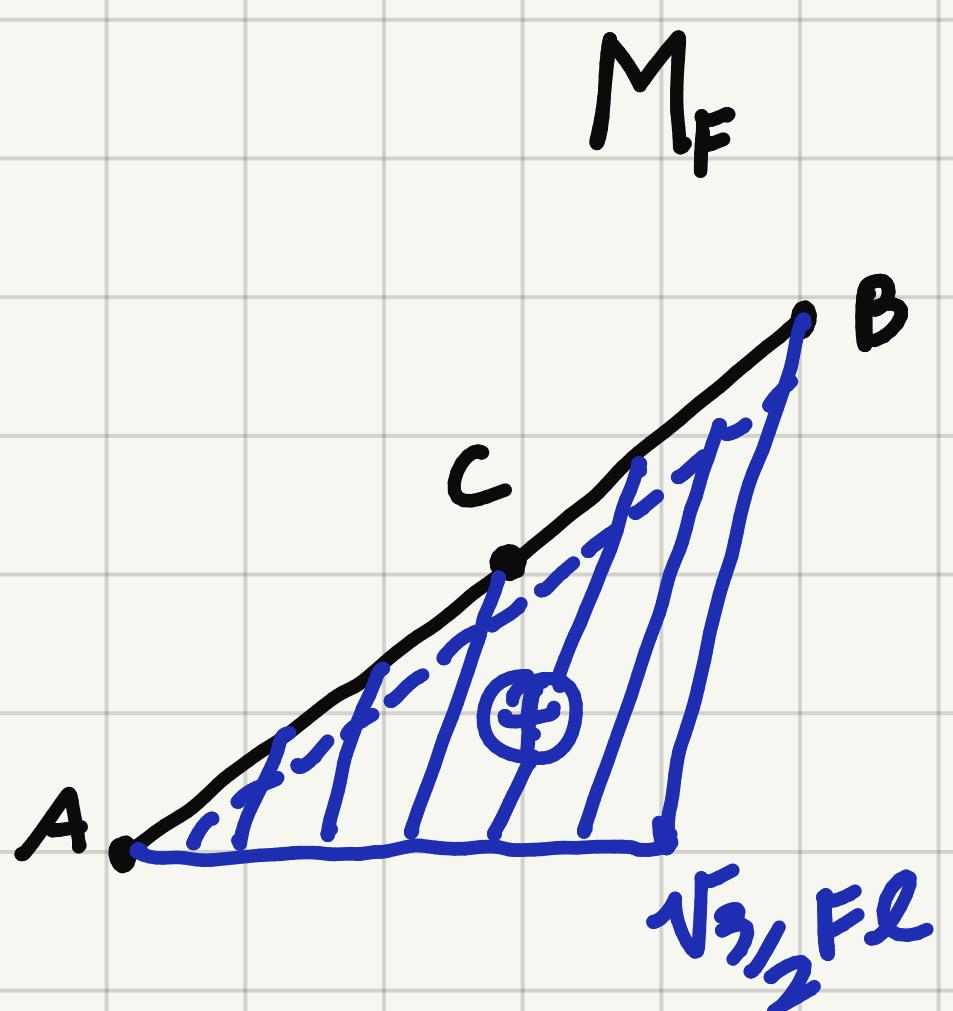
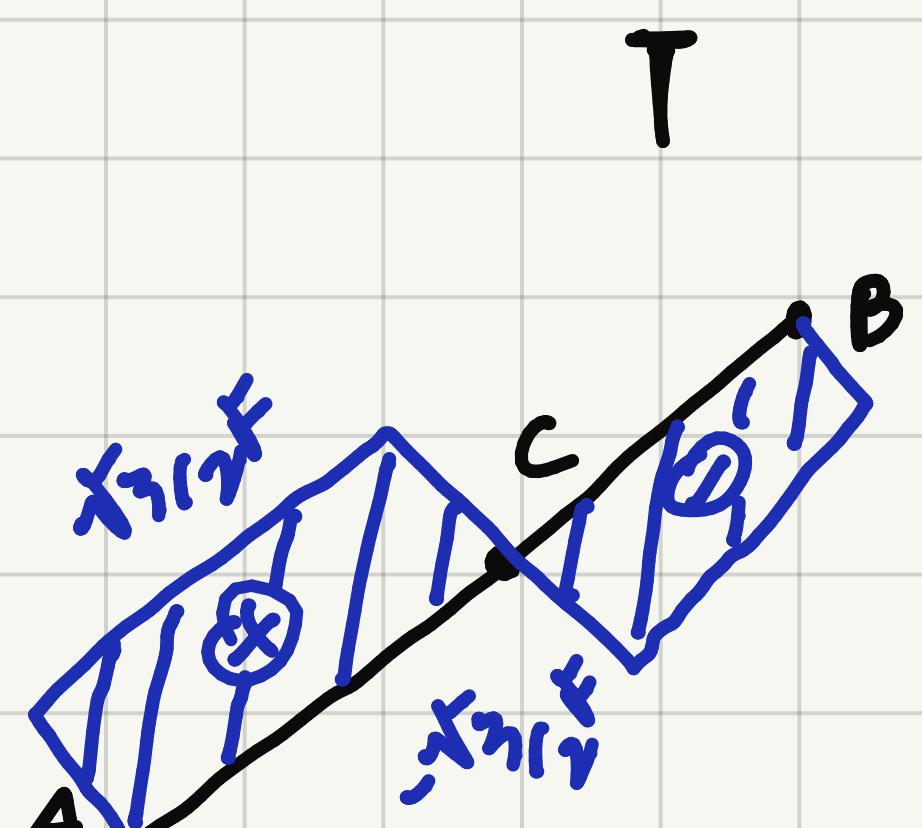
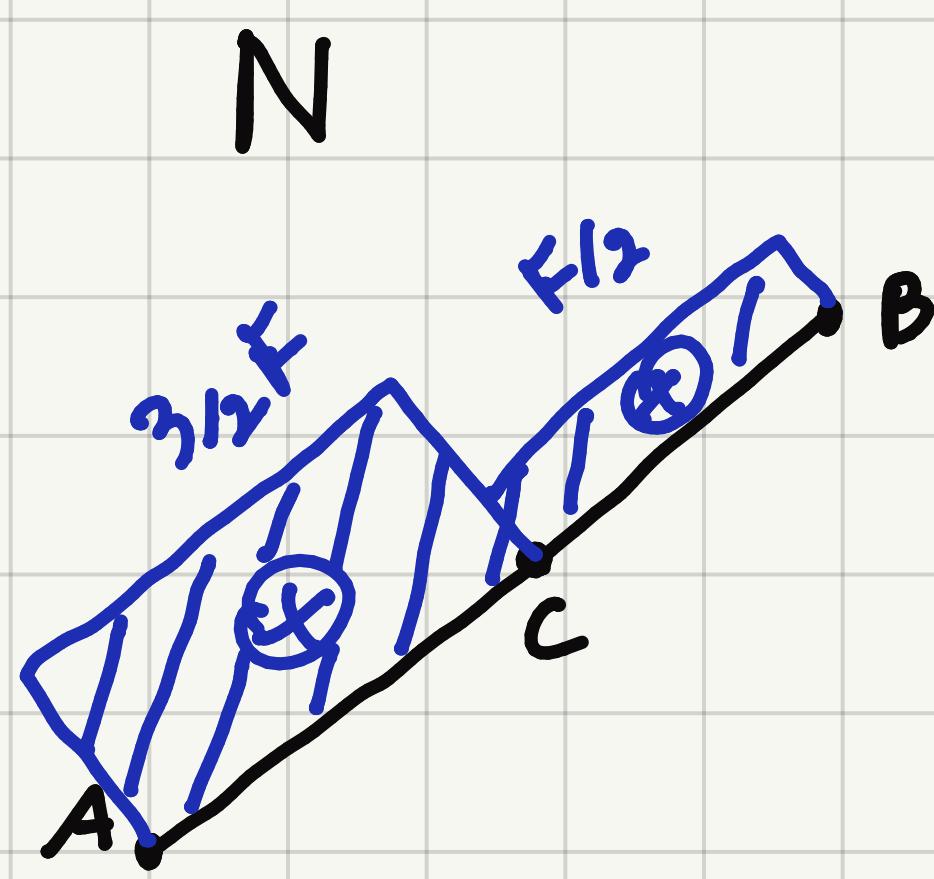
$$\begin{cases} N - \sqrt{3}F \cos(180 - 30) = 0 \\ T - \sqrt{3}F \sin(180 - 30) = 0 \\ K - M_F - \sqrt{3}F \sin(30) = 0 \end{cases}$$

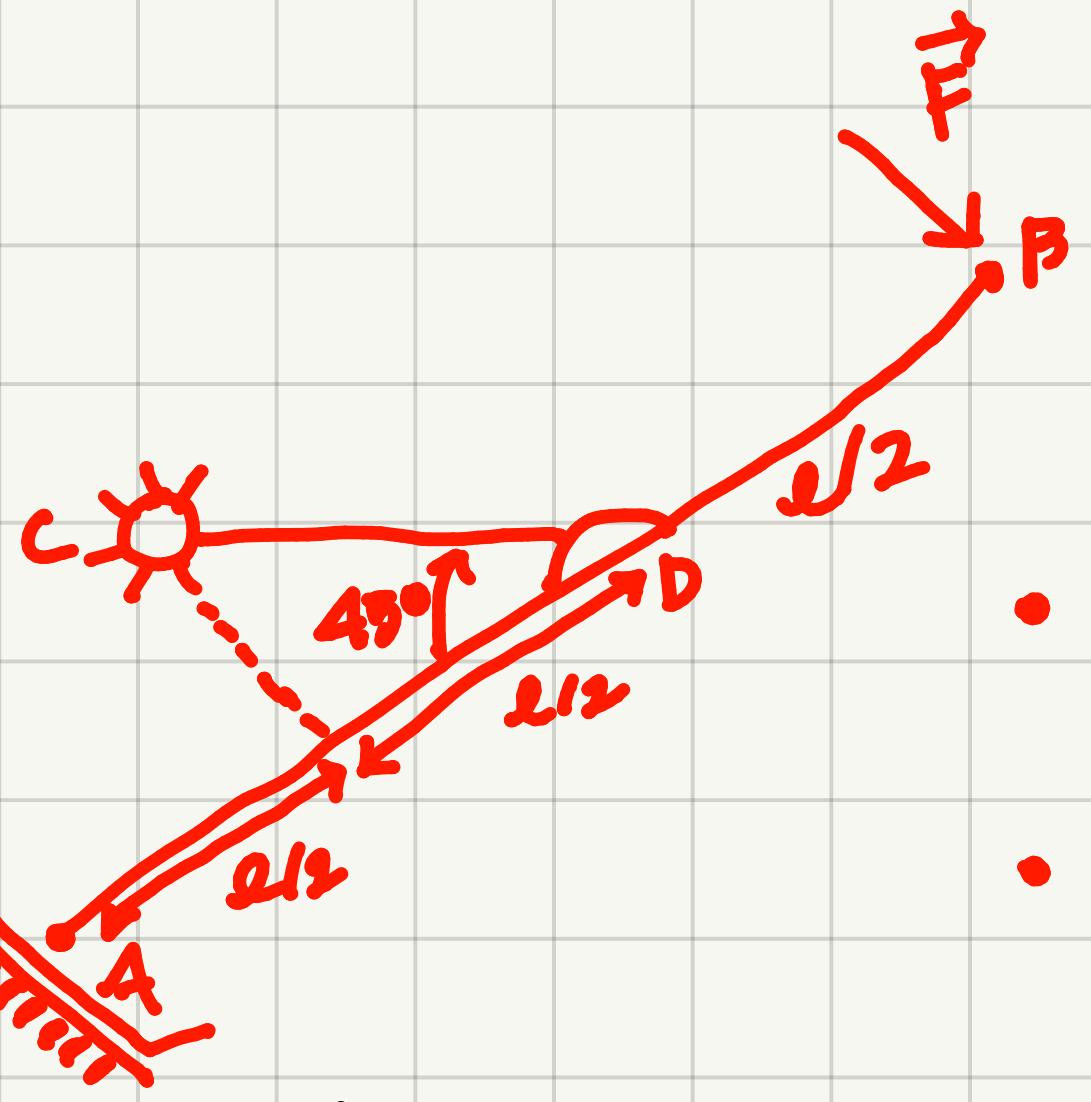
$$\begin{cases} N = \frac{3}{2}F \\ T = \frac{\sqrt{3}}{2}F \\ M_F = \frac{\sqrt{3}}{2}Fx \end{cases} \quad M(0) = 0 \quad M(l) = \frac{\sqrt{3}}{2}Fl$$



$$\begin{cases} N - F \cos(60) = 0 \\ T + F \sin(60) = 0 \\ -M_F + F \times SM(60) = 0 \end{cases} \quad M(0) = 0 \quad M(l) = \sqrt{3}\frac{1}{2}Fl$$

$$\begin{cases} N = \frac{F}{2} \\ T = -\frac{\sqrt{3}}{2}F \\ M = \frac{\sqrt{3}}{2}Fx \end{cases}$$

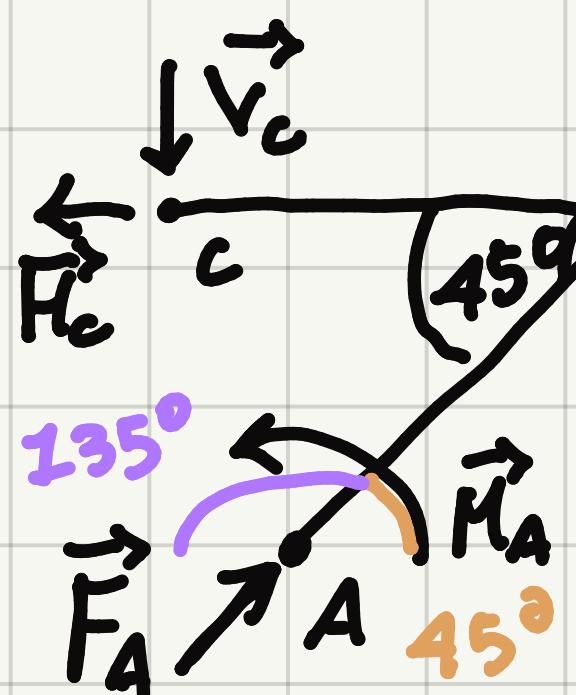
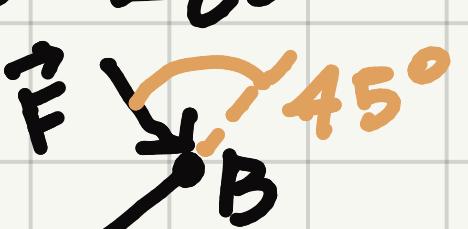




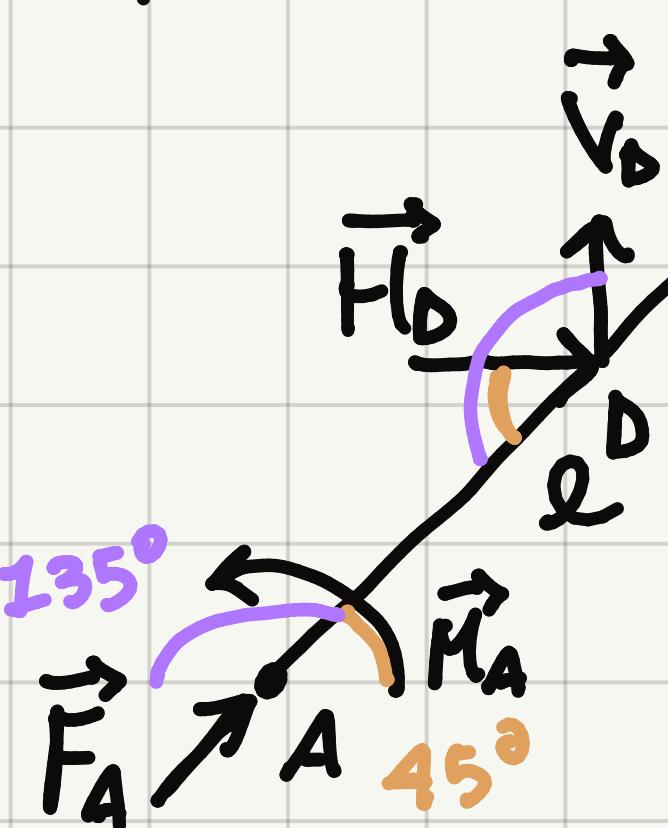
• REAZIONI VINCOLARI A, C, D

• AZIONI INTERNE AB

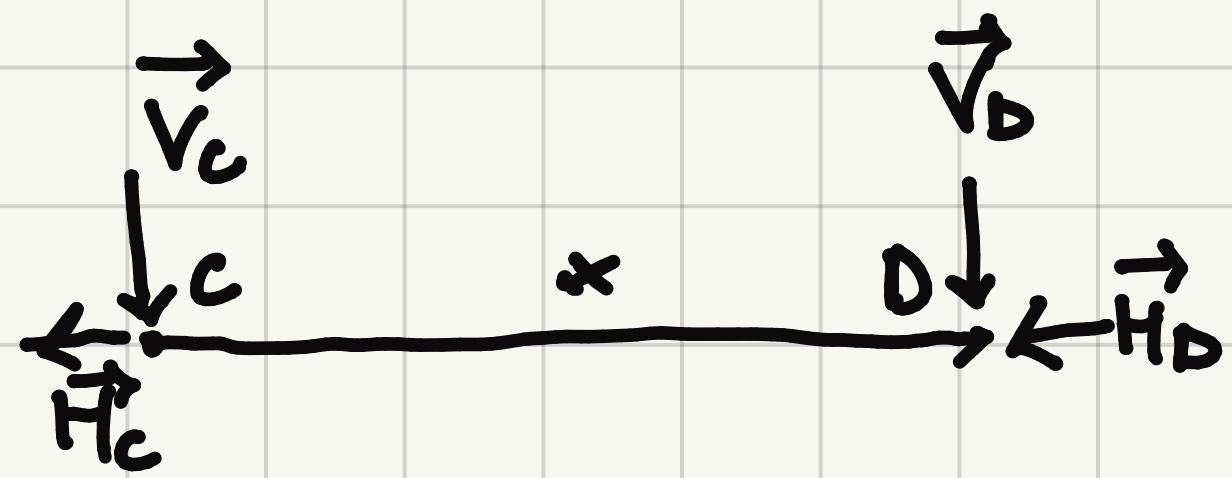
$$n = 3 \cdot 2 - (2 \cdot 4 + 2 \cdot 0 + 2 \cdot 1) = 0 \quad \checkmark$$



$$\left. \begin{array}{l} -H_C + F_A \cos(45^\circ) + F \cos(45^\circ) = 0 \\ -V_C + F_A \sin(45^\circ) - F \sin(45^\circ) = 0 \\ \frac{3}{2} M_C - \frac{3}{2} F \ell + M_A = 0 \end{array} \right\}$$

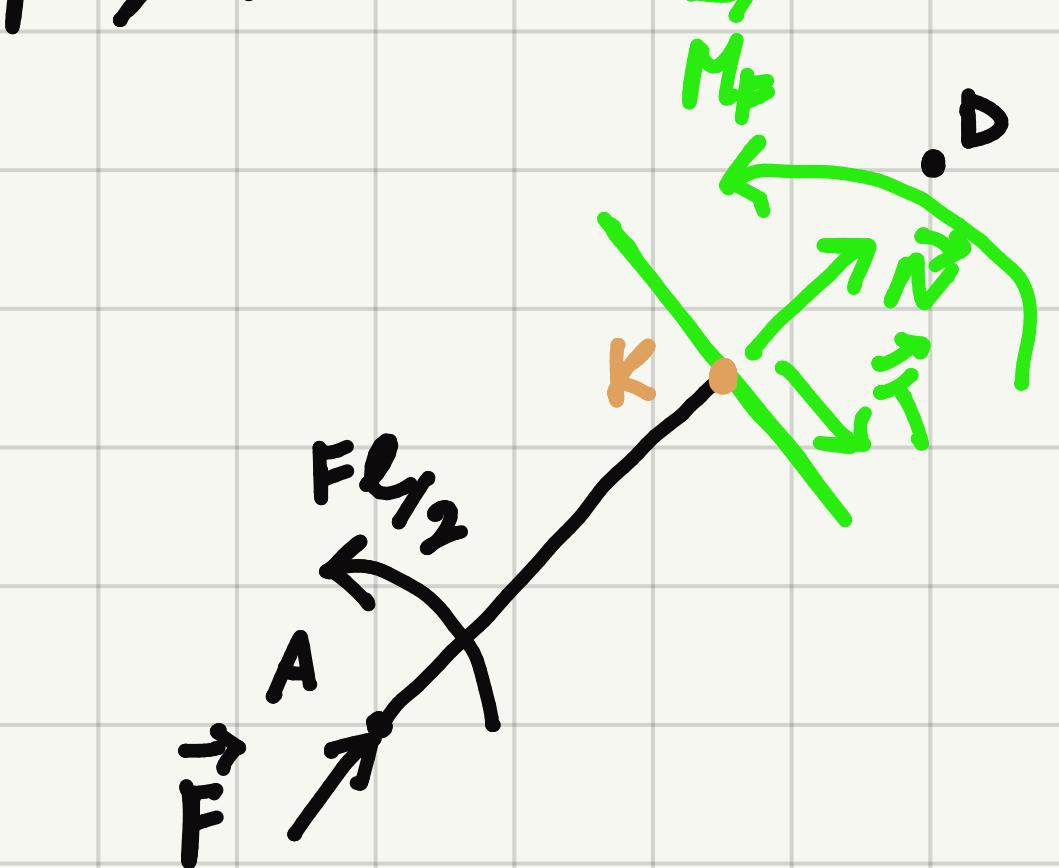
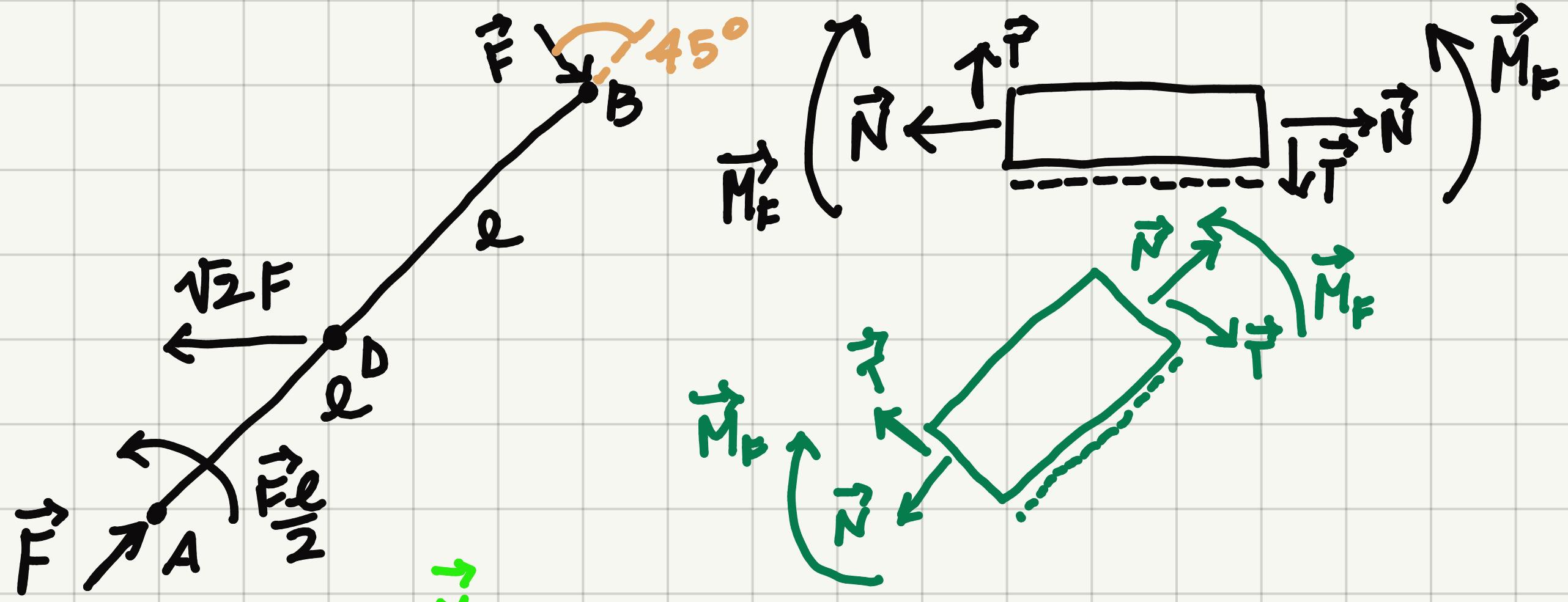


$$\left. \begin{array}{l} F_A \cos(45^\circ) + F \cos(45^\circ) + H_D = 0 \\ V_D + F_A \sin(45^\circ) - F \sin(45^\circ) = 0 \\ M_A - H_D \ell \sin(45^\circ) + V_D \ell \cos(45^\circ) - \frac{3}{2} F \ell = 0 \end{array} \right\}$$



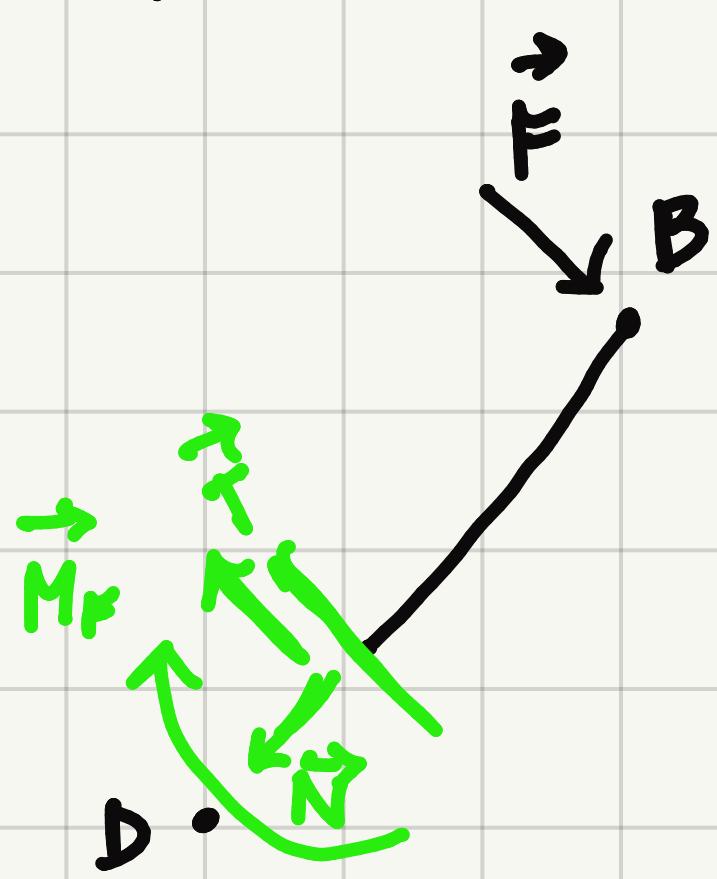
$$\left. \begin{array}{l} -H_C - H_D = 0 \\ -V_C - V_D = 0 \\ -x V_D = 0 \end{array} \right\}$$

$$\left. \begin{array}{l} H_D = -\sqrt{2} F \\ F_A = F \\ M_A = \frac{3}{2} F \ell \\ H_C = -\sqrt{2} F \\ V_C = 0 \\ V_D = 0 \end{array} \right\}$$



$$\begin{cases} N + F = 0 \\ T = 0 \\ M + F\ell_{1/2} = 0 \end{cases}$$

$$\begin{cases} N = -F \\ T = 0 \\ M = -F\ell_{1/2} \end{cases}$$



$$\begin{cases} N = 0 \\ T - F = 0 \\ -M - Fx = 0 \end{cases}$$

$$\begin{cases} N = 0 \\ T = F \\ M = -Fx \\ M(\frac{\ell}{2}) = -\frac{F\ell}{2} \\ M(0) = 0 \end{cases}$$

