

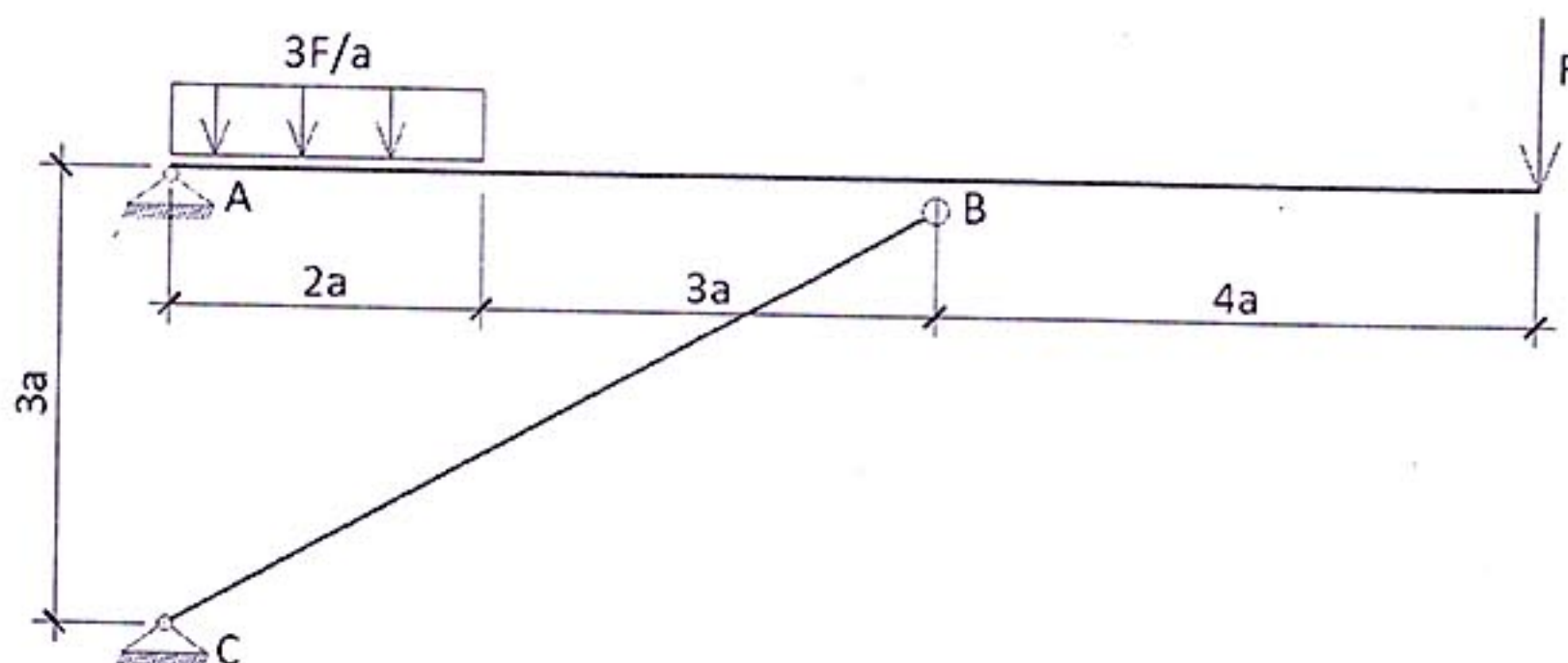
Ime i prezime: \_\_\_\_\_

Broj indeksa: \_\_\_\_\_

1. Zadatak

Za dati nosač i opterećenje odrediti:

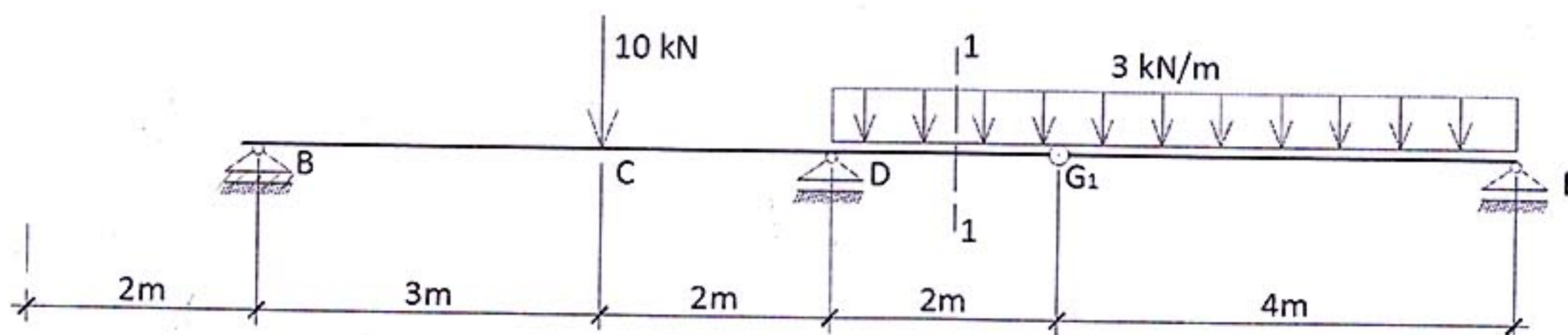
- a/ Reakcije oslonaca i silu u štapu (štap je zanemarljive težine);
- b/ Dijagrame presječnih sila.



2. Zadatak

Za dati nosač odrediti:

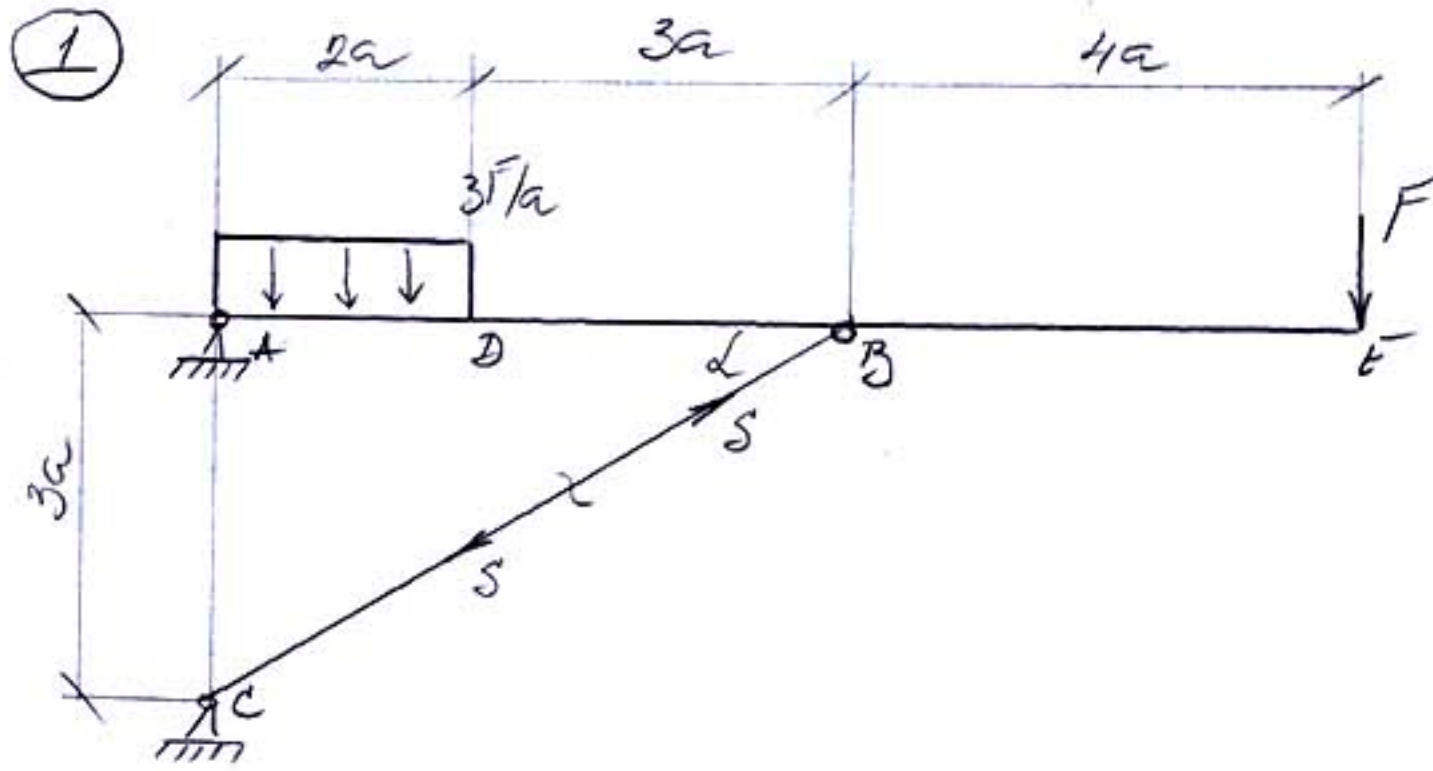
- a/ Reakcije oslonaca;
- b/ Dijagrame presječnih sila;
- c/ Funkcije momenta i transverzalne sile u presjeku 1-1.



Prof.dr Olivera Jovanović

# Статика - II карообъектум

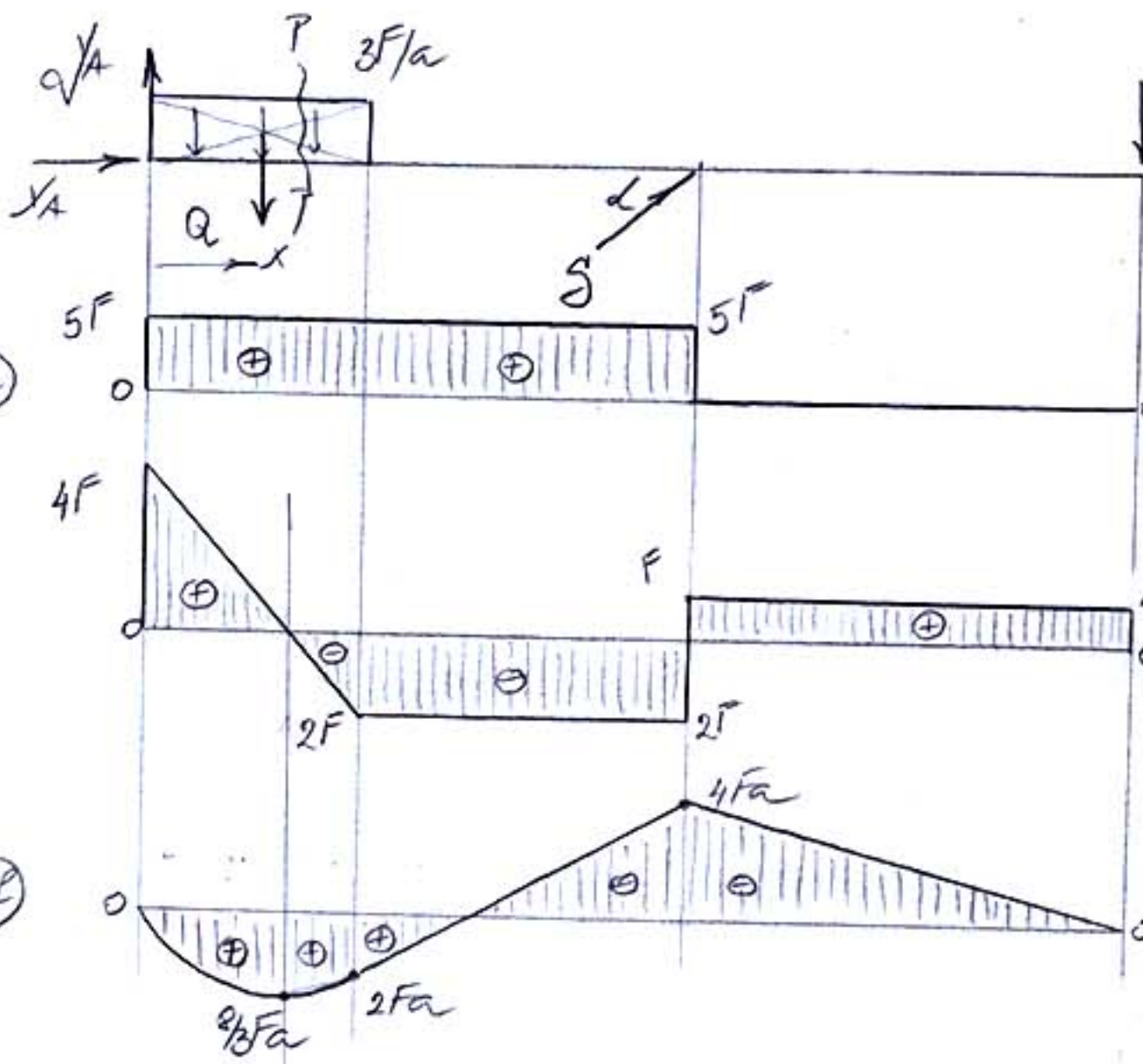
Урвуга II



$$\cos \alpha = \frac{5a}{\sqrt{25a^2 + 9a^2}} = \frac{5}{\sqrt{34}}$$

$$\sin \alpha = \frac{3}{\sqrt{34}}$$

$$Q = \frac{3F}{a} \cdot 2a = 6F$$



$$\sum M_A = 0 \Rightarrow F \cdot 9a - S \sin \alpha \cdot 5a - Qa = 0$$

$$S = \frac{\sqrt{34}}{3} (9F - 6F) = \underline{\underline{\sqrt{34}F}}$$

$$\sum X_i = 0 \Rightarrow X_A + S \cos \alpha = 0$$

$$X_A = -\sqrt{34} \frac{5F}{\sqrt{34}} = \underline{\underline{-5FRN}}$$

$$\sum Y_i = 0 \Rightarrow Y_A - Q + S \sin \alpha - F = 0$$

$$Y_A = Q - \sqrt{34}F = \frac{3}{\sqrt{34}}F + F$$

$$= 6F - 3F + F = \underline{\underline{4F}}$$

$$M_A^l = 0$$

$$M_B^l = Y_A \cdot 2a - Q \cdot a = 8Fa - 6Fa = 2Fa$$

$$M_B^l = Y_A \cdot 5a - Q \cdot 4a = 20Fa - 24Fa = -4Fa$$

$$M_B^d = -F \cdot 4a = -4Fa$$

$$M_E^d = 0$$

$$F_{tPP} = Y_A - \frac{3F}{a} \cdot x = 4F - \frac{3F}{a} \cdot x$$

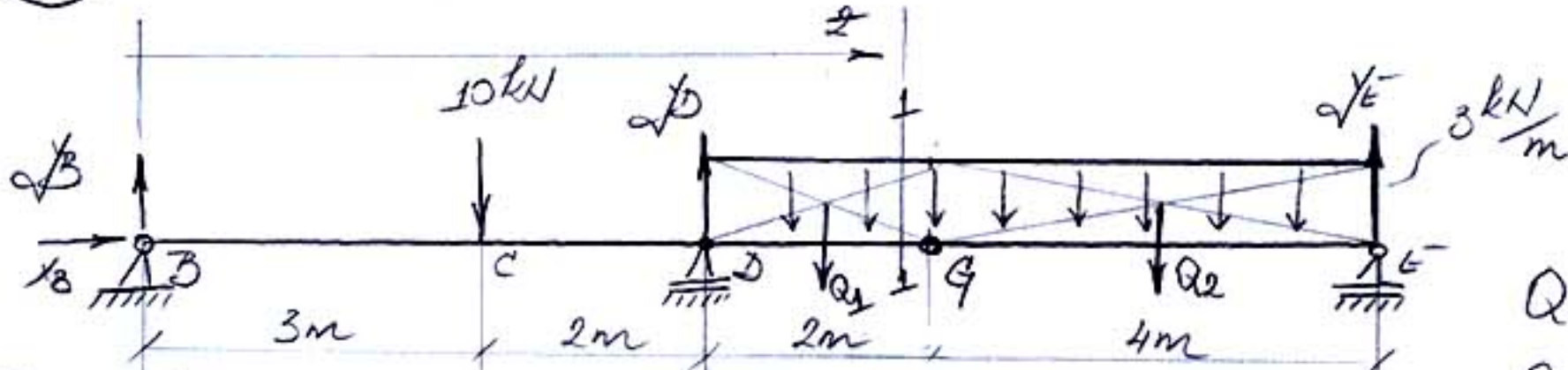
$$3a F_t = 0 \Rightarrow x = \underline{\underline{\frac{4}{3}a}}$$

$$M_f(F_t=0) = Y_A \cdot \frac{4}{3}a - \frac{3F}{a} \cdot \frac{4}{3}a \cdot \frac{1}{2} \cdot \frac{4}{3}a$$

$$= \frac{16}{3}Fa - \frac{8}{3}Fa = \underline{\underline{\frac{8}{3}Fa}}$$

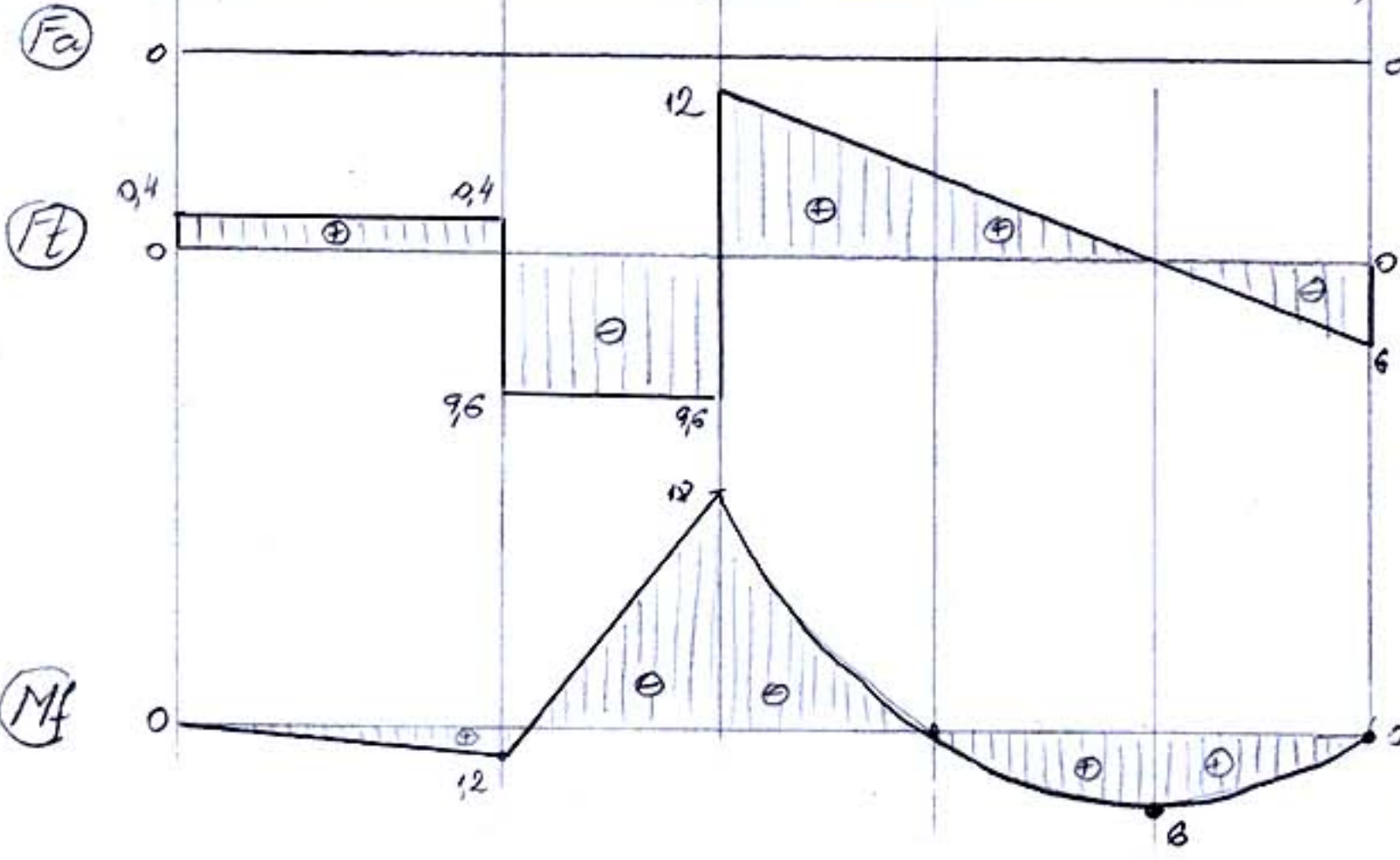


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$$Q_1 = 3 \cdot 2 = 6 \text{ kN}$$

$$Q_2 = 3 \cdot 4 = 12 \text{ kN}$$



$$\textcircled{1} M_G^d = 0 = 7 \cdot y_E \cdot 4 - Q_2 \cdot 2 = 0$$

$$y_E = 6 \text{ kN}$$

$$\textcircled{2} \sum X_i = 0 \Rightarrow y_B = 0$$

$$\textcircled{3} \sum M_B = 0$$

$$-10 \cdot 3 + y_D \cdot 5 - Q_1 \cdot 6 - Q_2 \cdot 9 + y_E \cdot 11 = 0$$

$$y_D = \frac{30 + 36 + 108 - 66}{5} = \frac{108}{5} = 21,6 \text{ kN}$$

$$\textcircled{4} \sum y_i = 0$$

$$y_B - 10 + y_D - Q_1 - Q_2 + y_E = 0$$

$$y_B = 10 - 21,6 + 6 + 12 - 6 = 0,4 \text{ kN}$$

уравнение

$$M_G^e = 0 = 7 \cdot y_B \cdot 7 - 10 \cdot 4 + y_D \cdot 2 - Q_1 \cdot 1 = 0$$

$$2,8 - 40 + 43,2 - 6 = 0 \textcircled{7}$$

$$F_t^{+1} = y_B - 10 + y_D - 3 \cdot (2 - 5)$$

$$= 0,4 - 10 + 21,6 - 32 + 15 = -32 + 27$$

$$M_f^{+1} = y_B \cdot 2 - 10(2-3) + y_D(2-5) - 3(2-5) \cdot \frac{2-5}{2}$$

$$= 0,4 \cdot 2 - 10 \cdot (-1) + 30 + 21,6 \cdot (-3) - 1,5(2^2 - 10 \cdot 2 + 25)$$

$$= -1,5 \cdot 2^2 + 27 \cdot 2 - 115,5$$

за  $F_t = 0 \Rightarrow -32 + 27 = 0 \Rightarrow 2 = 9$

$$M_f(F_t=0) = -1,5 \cdot 9^2 + 27 \cdot 9 - 115,5 = 6$$

$$M_B^e = 0$$

$$M_C^e = y_B \cdot 3 = 1,2 \text{ kNm}$$

$$M_D^e = y_B \cdot 5 - 10 \cdot 2 = -18 \text{ kNm}$$

$$M_D^d = y_E \cdot 6 - Q_2 \cdot 4 - Q_1 \cdot 1$$

$$= 36 - 48 - 6 = -18 \text{ kNm}$$

$$M_G^d = 0$$

$$M_E^d = 0$$