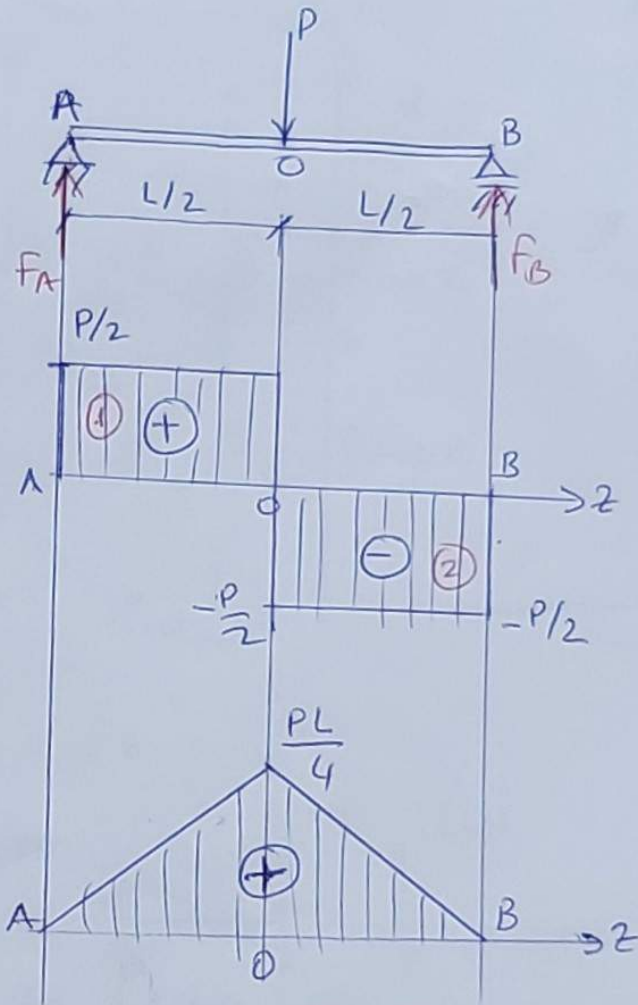


ALAN METODU ÖRNEKLERİ

ÖRNEK 2



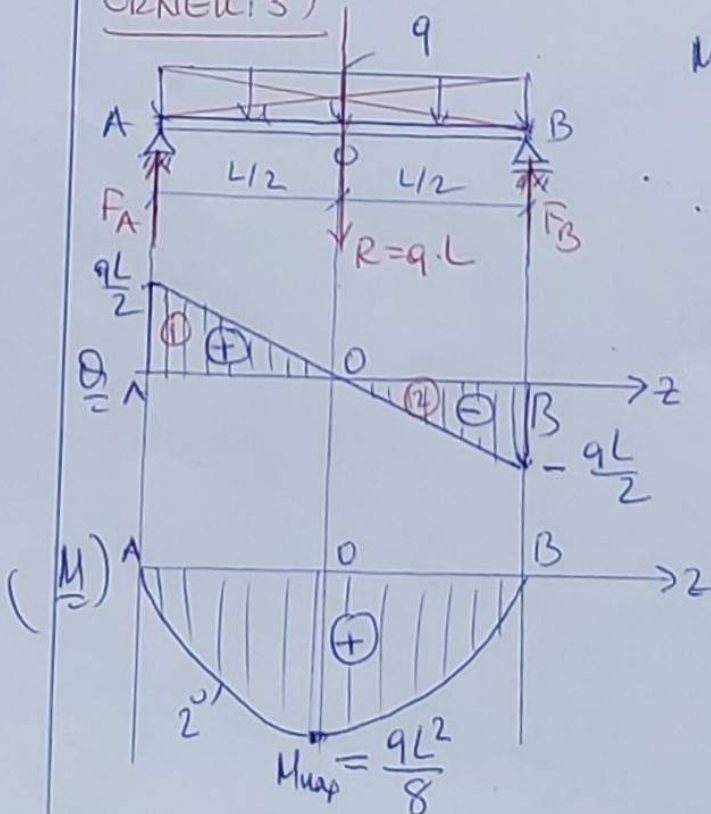
Mesnet tepkileri

$$F_A = F_B = \frac{P}{2}$$

$$A_1 = + \left(\frac{P}{2} \cdot \frac{L}{2} \right) = + \frac{PL}{4}$$

$$A_2 = - \left(\frac{P}{2} \cdot \frac{L}{2} \right) = - \frac{PL}{4}$$

ÖRNEK 3

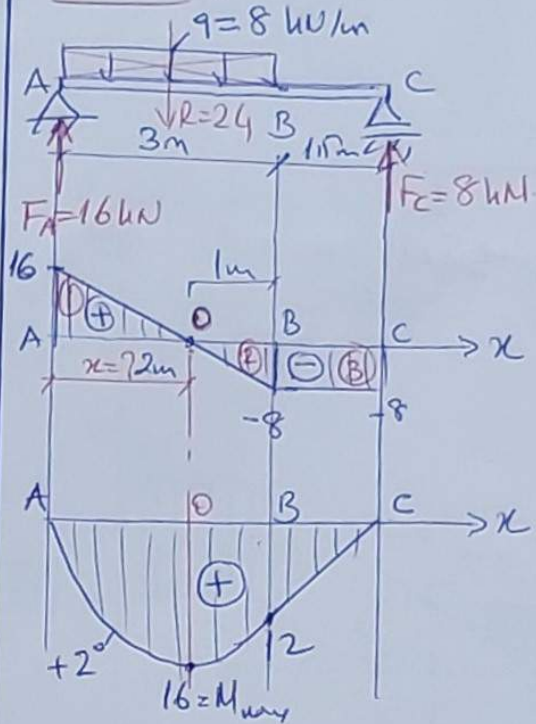


Mesnet tepkileri: $F_A = F_B = \frac{q \cdot L}{2}$

$$A_1 = + \frac{1}{2} \left(\frac{qL}{2} \cdot \frac{L}{2} \right) = \frac{qL^2}{8}$$

$$A_2 = - \frac{1}{2} \left(\frac{qL}{2} \cdot \frac{L}{2} \right) = - \frac{qL^2}{8}$$

ÖRNEK 7



Mesnet tepkileri

$$F_A = 16 \text{ kN} \uparrow, F_B = 8 \text{ kN} \uparrow$$

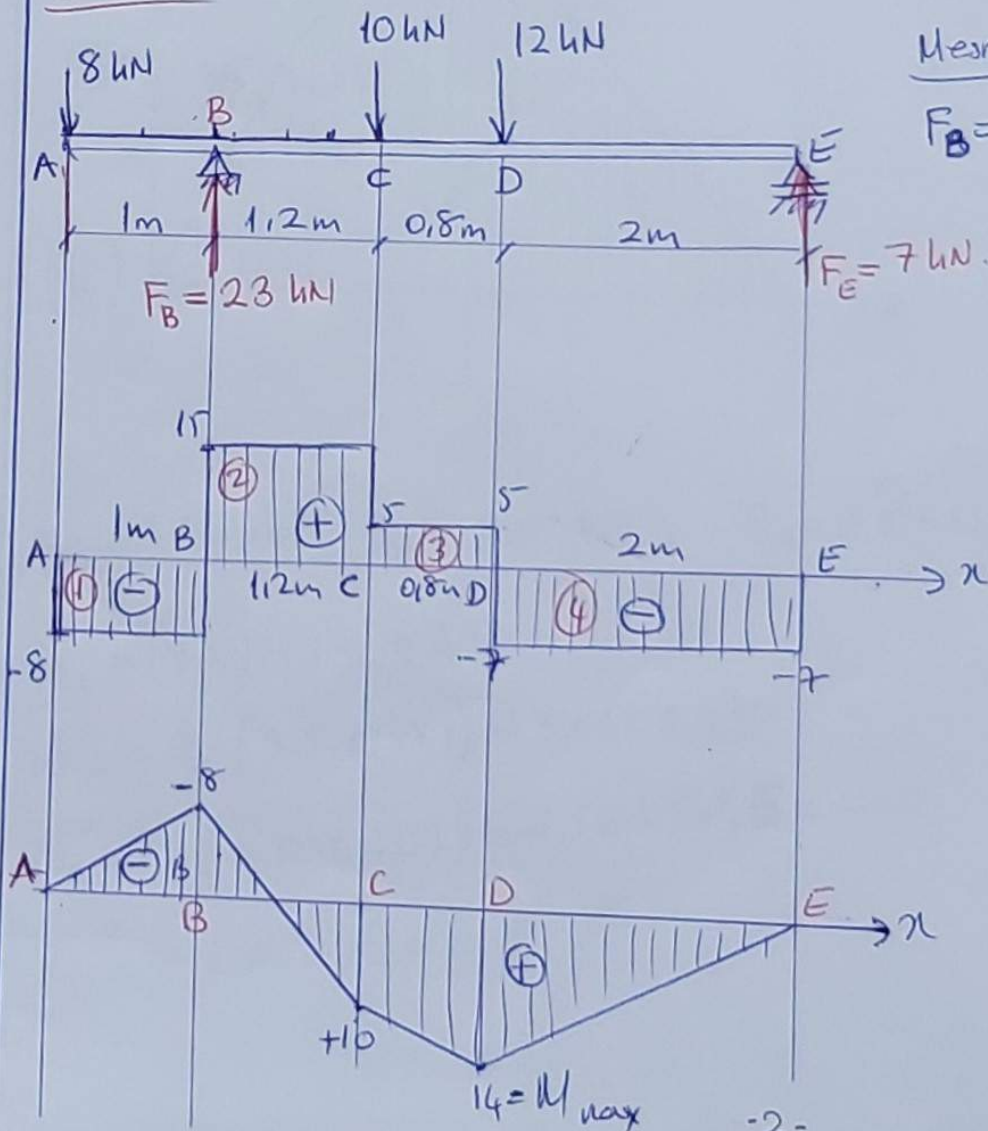
$$\frac{x}{16} = \frac{3-x}{8} \Rightarrow x = 2 \text{ m}$$

$$A_1 = +\frac{1}{2}(16 \cdot 2) = 16$$

$$A_2 = -\frac{1}{2}(8 \cdot 1) = -4$$

$$A_3 = -(8 \cdot 1) = -12$$

ÖRNEK 8



Mesnet tepkileri

$$F_B = 23 \text{ kN} \uparrow, F_E = 7 \text{ kN} \uparrow$$

$$A_1 = -(8 \cdot 1) = -8$$

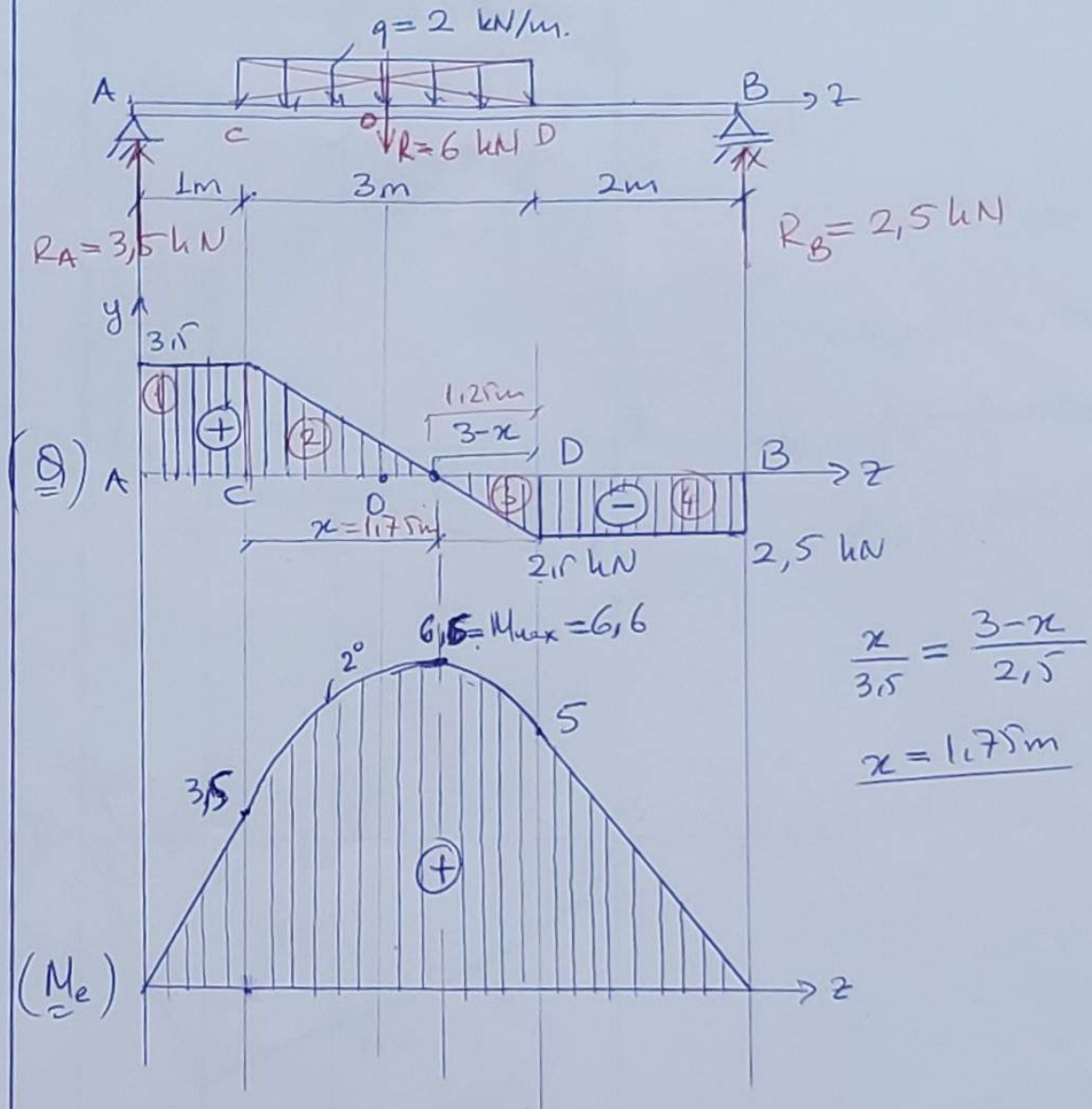
$$A_2 = +(17 \cdot 1.2) = +18$$

$$A_3 = +(7 \cdot 0.8) = +4$$

$$A_4 = -(7 \cdot 2) = -14$$

ALAN METODU İLE ÖRNEKLER

ÖRNEK 1)



Mesnet tepkileri: $R_B = 2.5 \text{ kN}$, $R_A = 3.5 \text{ kN}$

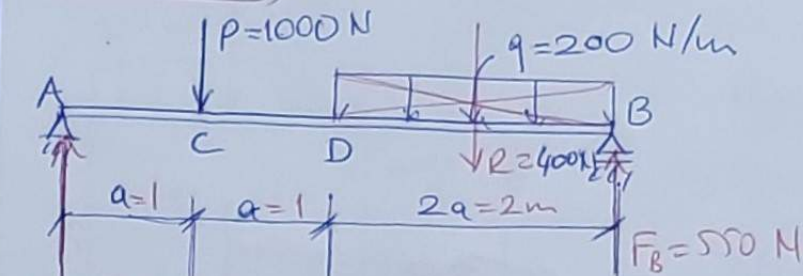
$$A_1 = (3.5)(1) = +3.5$$

$$A_2 = \frac{1}{2} (3.5 \cdot 1.75) \approx 3.062 \approx 3.1$$

$$A_3 = -\frac{1}{2} (2.5 \cdot 1.25) = -1.562 \approx -1.6$$

$$A_4 = - (2 \cdot 2.5) = -5$$

ÖRNEK: 6)



$F_A = 850 \text{ N}$
850

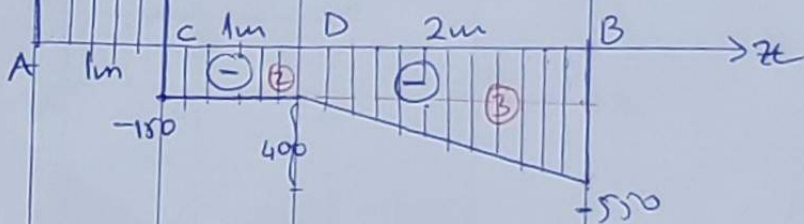
$$A_1 = + (850 \cdot 1) = +850$$

$$A_2 = - (100 \cdot 1) = -100$$

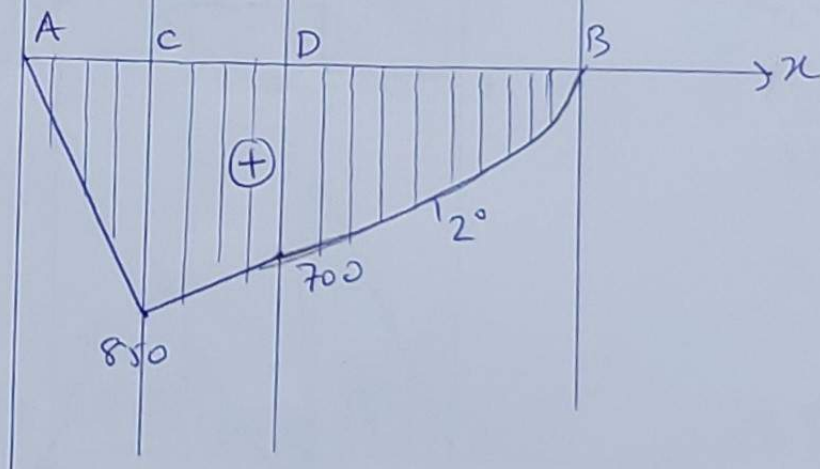
$$A_3 = - \left[\frac{1}{2} 400 \cdot 2 + 2 \cdot 100 \right]$$

$$A_3 = -700$$

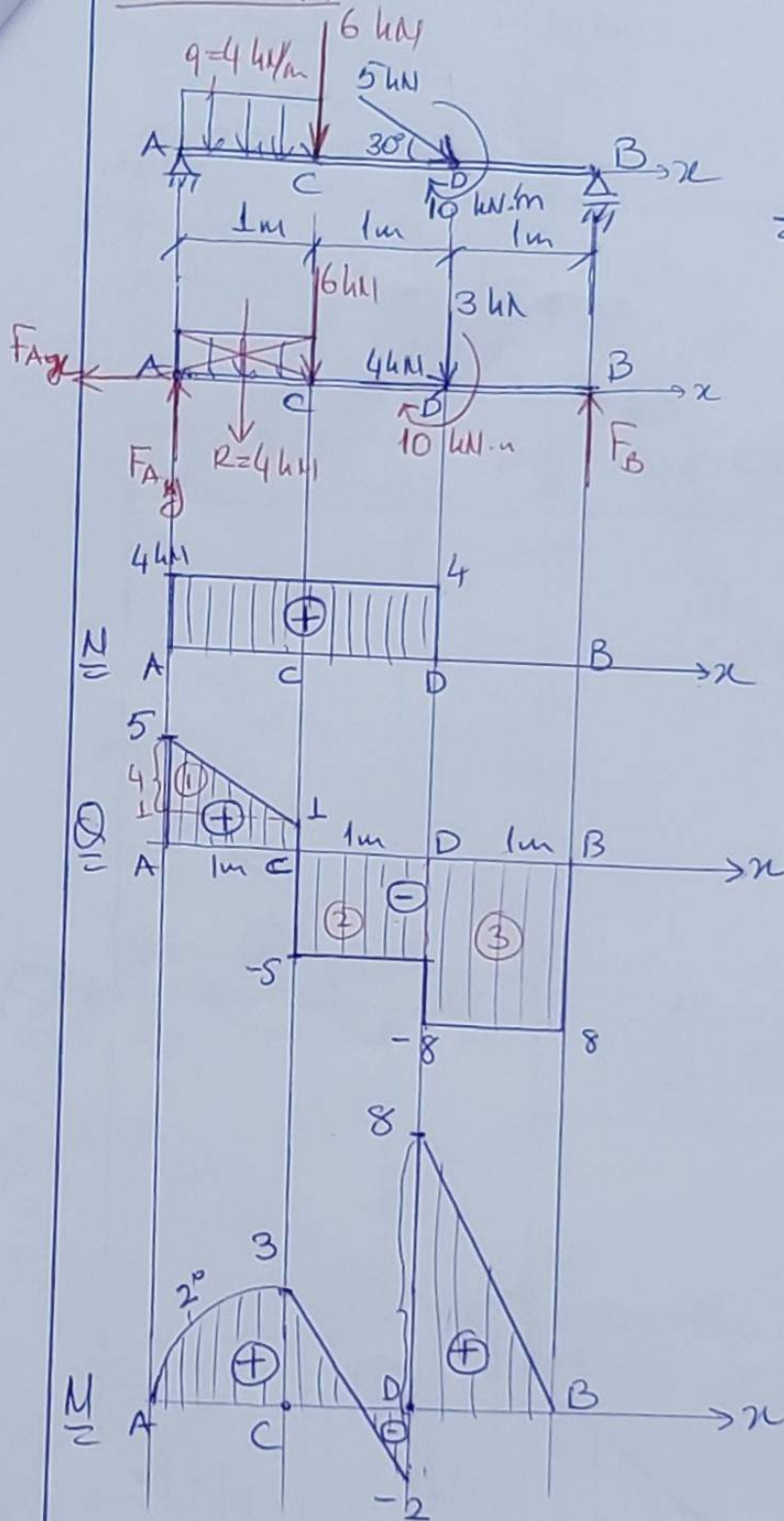
$\frac{Q}{2}$



$\left(\frac{M}{2} \right)$



ÖRNEK: 4)



Mesnet tepkileri

$$\sum F_x = 0 : F_{Ax} = 4 \text{ kN}$$

$$\sum M_A = 0 : F_B = 8 \text{ kN}$$

$$\sum M_B = 0 : F_{Ay} = 5 \text{ kN}$$

$$A_1 = \frac{1}{2} (4 \cdot 1) + (1 \cdot 1)$$

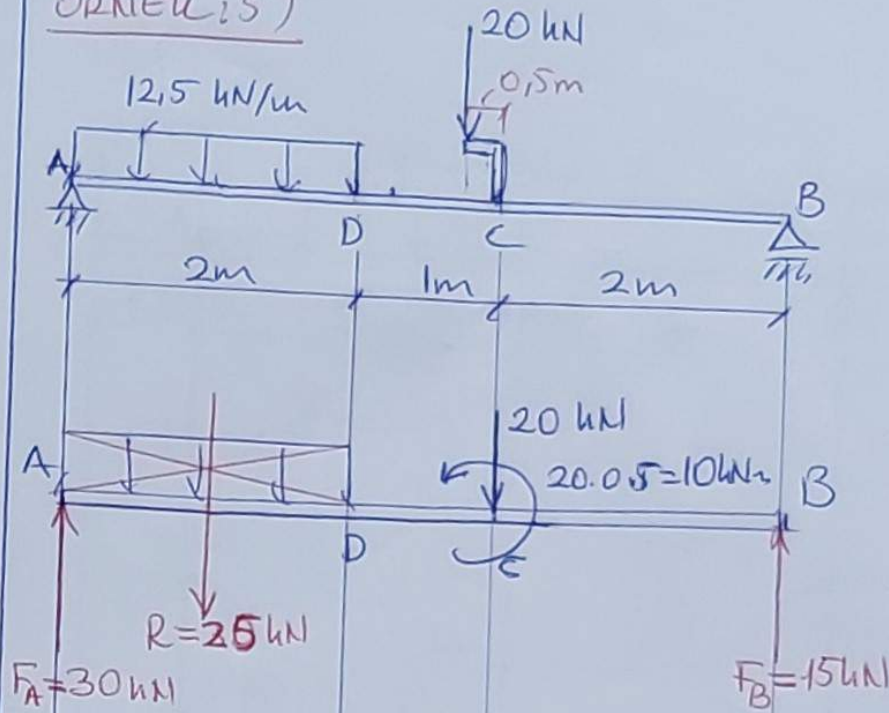
$$A_1 = +3$$

$$A_2 = -(5 \cdot 1) = -5$$

$$A_3 = -(8 \cdot 1) = -8$$

$$M_D = 10 \text{ kN.m}$$

ÖRNEK 15)



$$A_1 = \frac{1}{2} (25 \cdot 2) + 5 \cdot 2$$

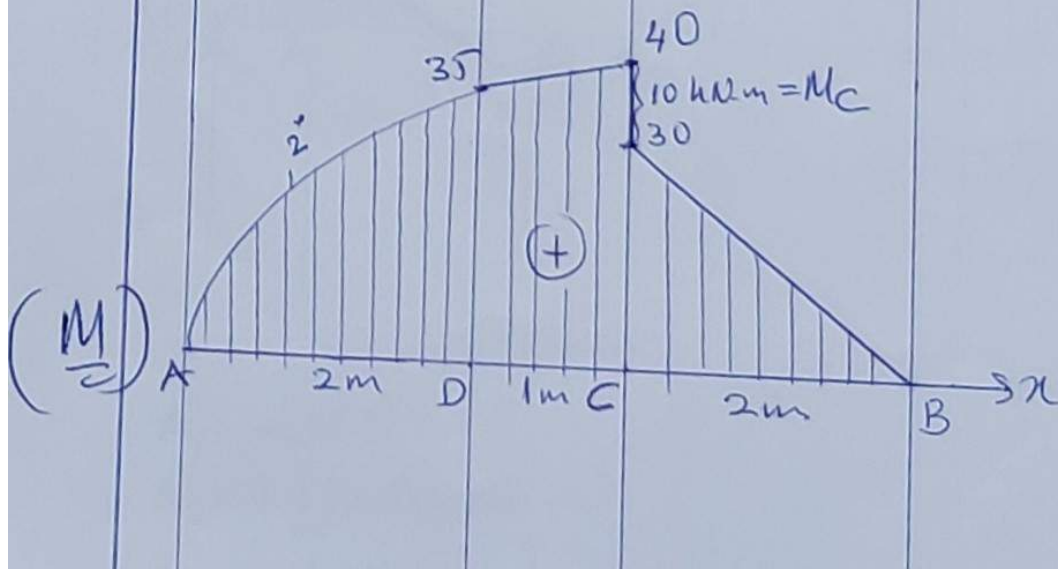
$$A_1 = 35$$

$$A_2 = + (5 \cdot 1) = +5$$

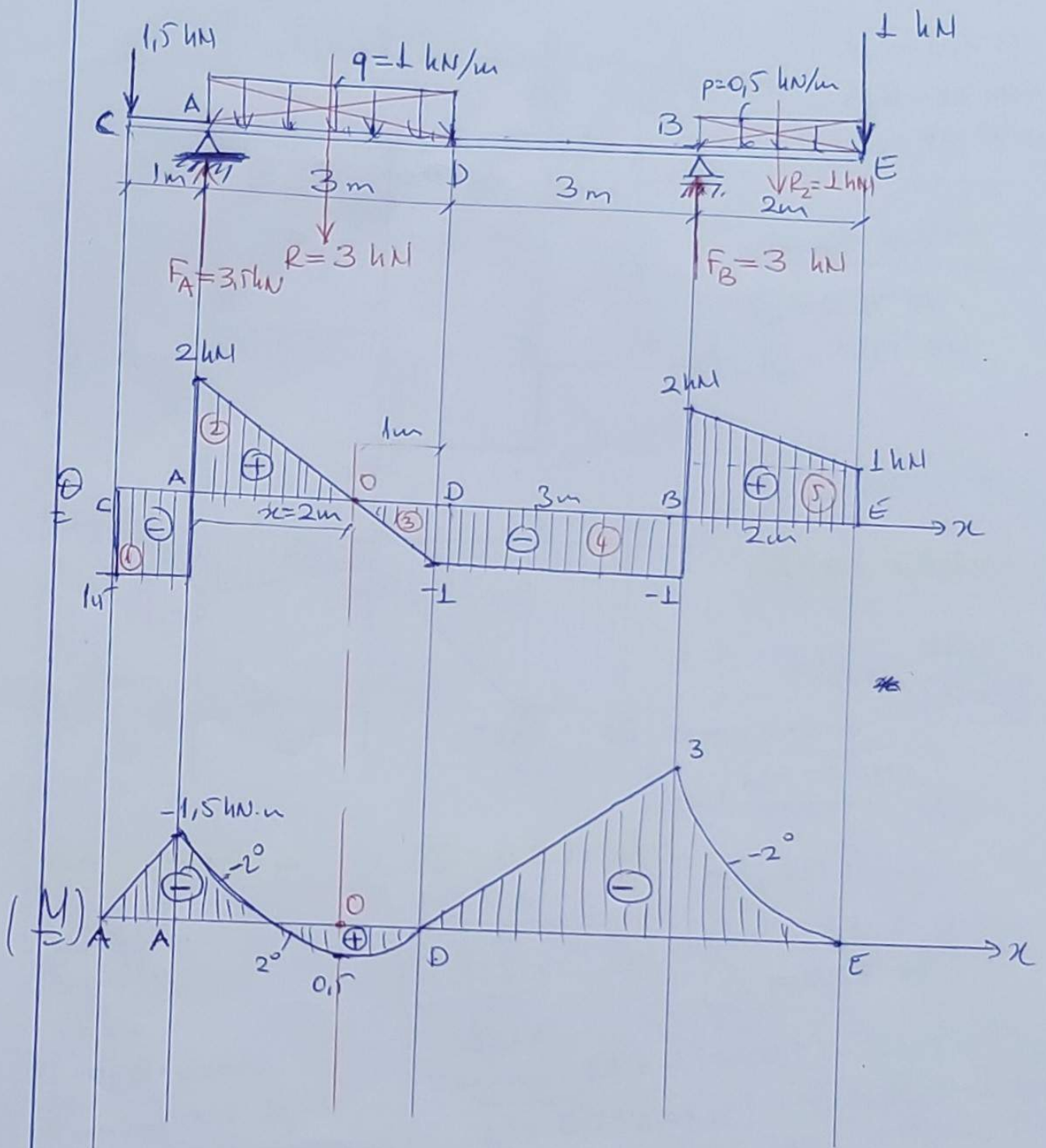
$$M_C = 10 \text{ kN.m} \leftarrow$$

$$A_3 = - (15 \cdot 2)$$

$$A_3 = -30$$



ÖRNEK 17)



$$A_1 = -(1 \cdot 1) = -1$$

$$A_2 = +\frac{1}{2}(2 \cdot 2) = +2$$

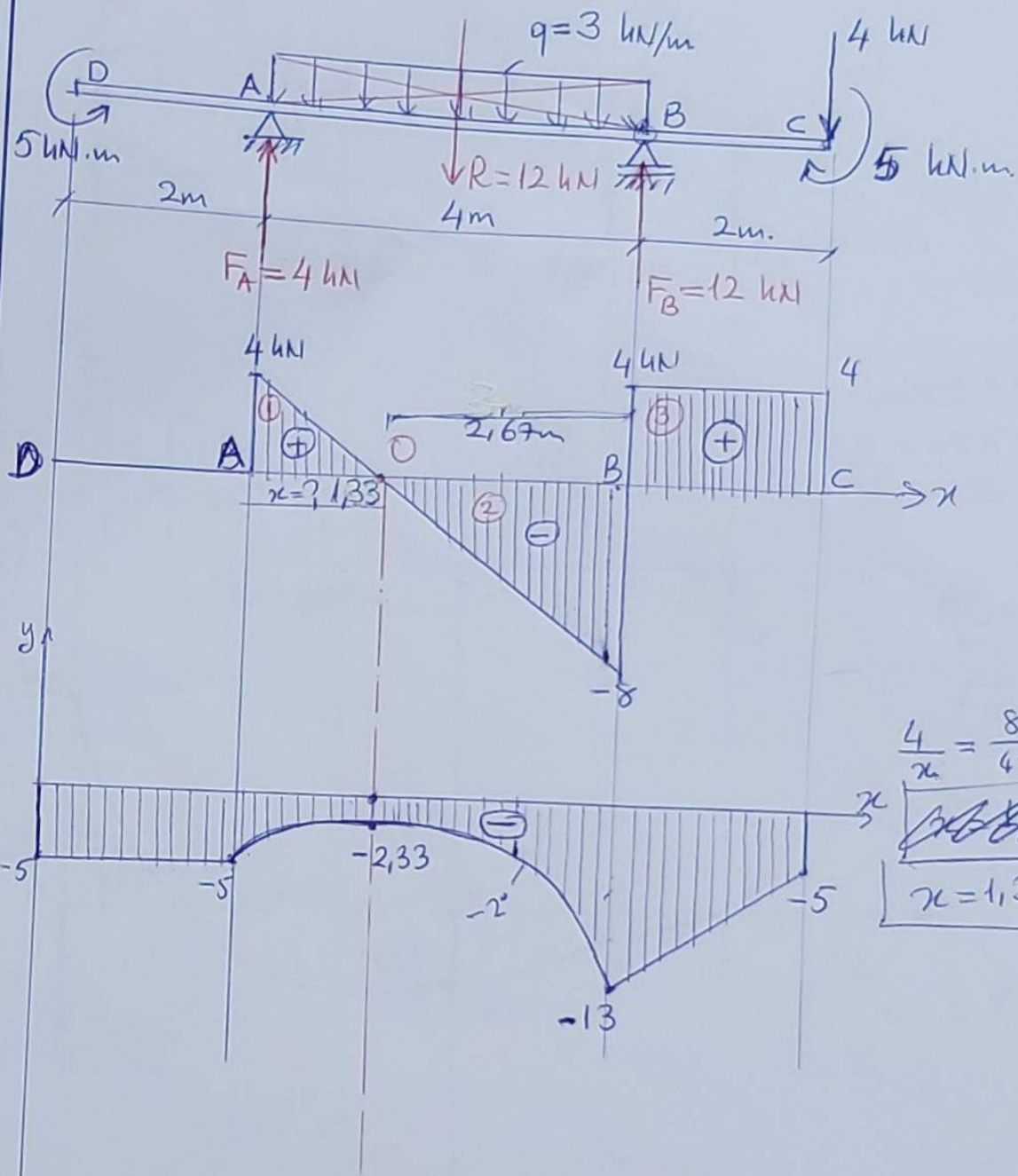
$$A_3 = -\frac{1}{2}(1 \cdot 1) = -\frac{1}{2}$$

$$A_4 = -(3 \cdot 1) = -3$$

$$A_5 = \frac{1}{2}[2 + 1] \cdot 2 = +3$$

$$\frac{x}{2} = \frac{3-x}{1} \Rightarrow x = 2 \text{ m}$$

ÖRNEK:



$$\frac{4}{x} = \frac{8}{4-x}$$

$$x = 1,33 \text{ m}$$

$$A_1 = + \frac{1}{2} (4 \cdot 1,33) = +2,66 \approx +2,67$$

$$A_2 = - \left(\frac{1}{2} \cdot 3 \cdot 8 \right) = -12$$

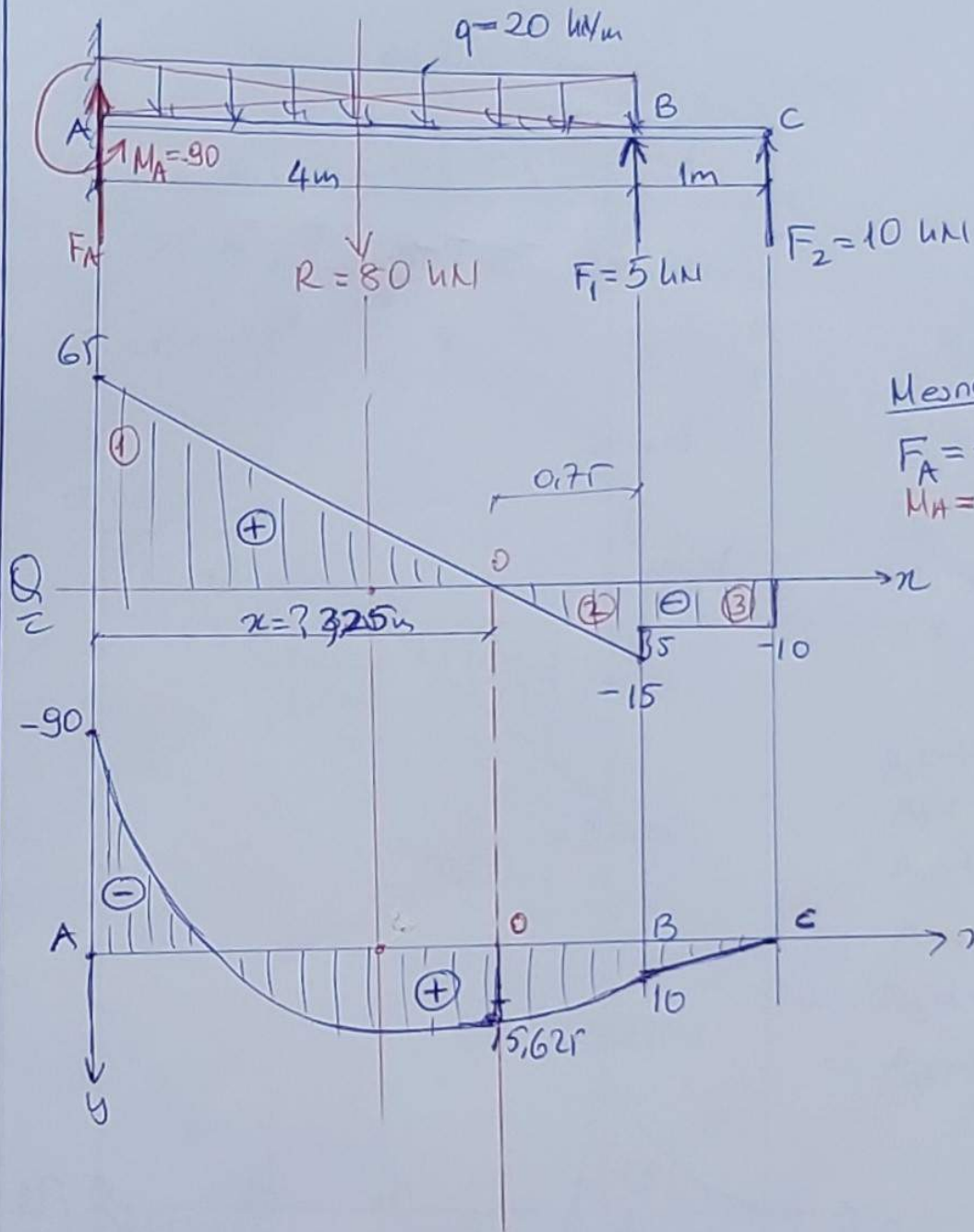
$$A_3 = + (4 \cdot 2) = +8$$

$$A_1 = \frac{1}{2} (4 \cdot 1,33) = +2,66 \approx +2,67$$

$$A_2 = - \frac{1}{2} (8 \cdot 2,67) = -10,68$$

$$A_3 = + (4 \cdot 2) = +8$$

ÖRNEK 1



Mesnet tepkileri

$$F_A = +65 \text{ kN} \uparrow$$

$$M_A = -90 \text{ kNm}$$

$$\frac{65}{x} = \frac{15}{4-x}$$

$$x = 3,25 \text{ m}$$

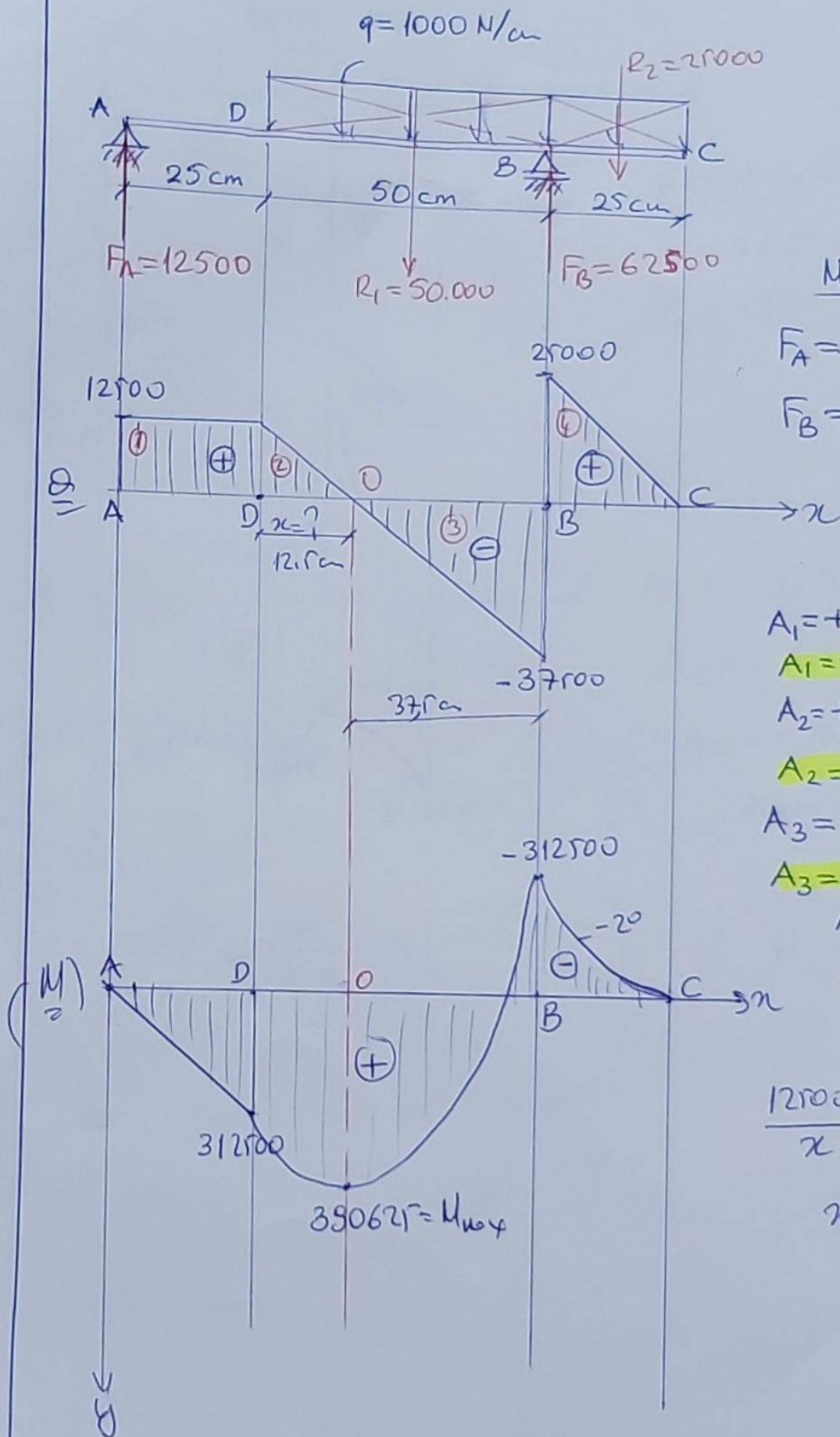
$$M_A = -90 \text{ kNm} \hookrightarrow$$

$$A_1 = +\left(\frac{1}{2} \cdot 65 \cdot (3,25)\right) = +105,625$$

$$A_2 = -\left(\frac{1}{2} \cdot (15 \cdot 0,75)\right) = -5,625$$

$$A_3 = -(10 \cdot 1) = -10$$

ÖRNEK



Menet tepkileri

$$F_A = 12500 \text{ N}$$

$$F_B = 62500 \text{ N}$$

$$A_1 = +(12500 \cdot 25)$$

$$A_1 = +312500$$

$$A_2 = +\frac{1}{2}(12500 \cdot 12.5)$$

$$A_2 = +78125$$

$$A_3 = -\frac{1}{2}(37500 \cdot 37.5)$$

$$A_3 = -703125$$

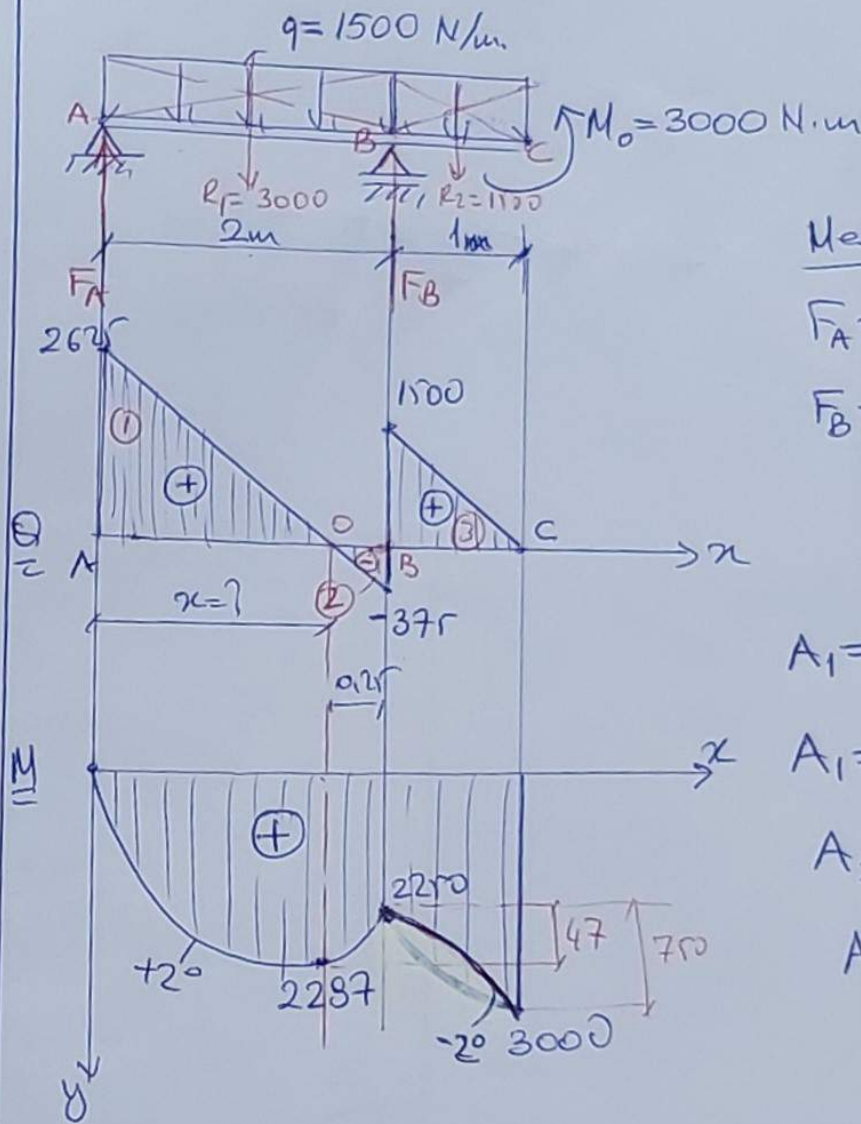
$$A_4 = +\frac{1}{2}(25000 \cdot 25)$$

$$A_4 = +312500$$

$$\frac{12500}{x} = \frac{37500}{50 - x}$$

$$x = 12.5 \text{ cm}$$

ÖRNEK



Mesnet tepkileri

$$F_A = 2625 \text{ N}$$

$$F_B = 1875 \text{ N}$$

$$A_1 = + \left(\frac{1}{2} (2625 \cdot 1.75) \right)$$

$$A_1 = + 2296,875 = + 2297$$

$$A_2 = - \frac{1}{2} (375 \cdot 0,25)$$

$$A_2 = - 46,875 \approx - 47$$

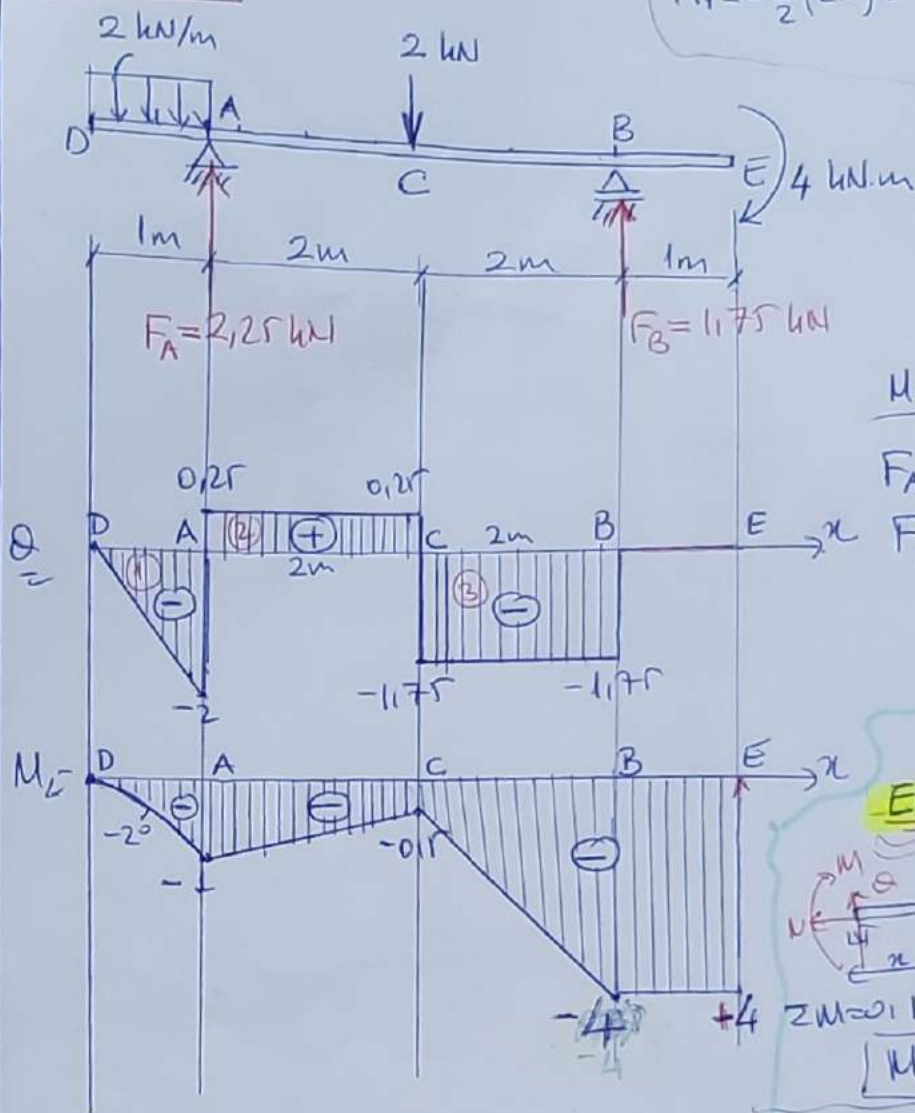
$$A_3 = \frac{1}{2} (1500 \cdot 1)$$

$$A_3 = + 750$$

$$M_{C_o} = - 3000 \text{ N.m}$$

$$\frac{2625}{x} = \frac{375}{2-x} \Rightarrow x = 1,75 \text{ m}$$

ÖRNEK 1



ALTERNATIVE METHOD?

$$A_1 = -\frac{1}{2}(2,1) = -1, \quad A_2 = +(0,25; 2) = +0,5$$

$$A_2 = +0,5$$

$$A_3 = -(1,75; 2)$$

$$A_3 = -3,175 \text{ kN.m}$$

$$M_E = +4 \text{ kN.m}$$

Mesnet tepkileri

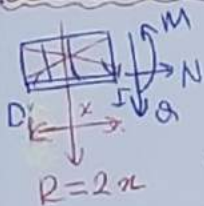
$$F_A = 2,25 \text{ kN}$$

$$F_B = 1,75 \text{ kN}$$

EB: $0 \leq x_4 \leq 1 \text{ m}$

$$\begin{aligned} \sum F_y = 0 & \Rightarrow Q = 0 \\ \sum M = 0: M + 4 = 0 & \Rightarrow M = -4 \text{ kN.m} \end{aligned}$$

DA: $0 \leq x_1 \leq 1 \text{ m}$



$$\sum F_y = 0: Q + 2x = 0$$

$$Q = -2x$$

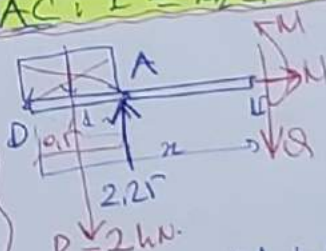
$$\sum M_D = 0$$

$$M + (2x)\left(\frac{x}{2}\right) = 0$$

$$M = -x^2$$

Parabol is bukey olarak

AC: $1 \leq x_2 \leq 3 \text{ m}$



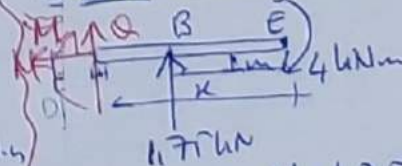
$$\sum F_y = 0: Q + 2 - 2,25 = 0$$

$$Q = 0,25 \text{ kN}$$

$$\sum M_D = 0: M + 2(x - 0,5) - 2,25(x - 1) = 0$$

$$M = 0,25x - 1,25$$

BC: $1 \leq x_3 \leq 3 \text{ m}$



$$\sum F_y = 0$$

$$Q + 1,75 = 0$$

$$Q = -1,75$$

$$\sum M_B = 0: M - 1,75(x - 1) + 4 = 0$$

$$M = 1,75x - 5,75$$

$$x = 1: M_E = -4 \text{ kN.m}$$

$$x = 3: M_C = -0,5$$