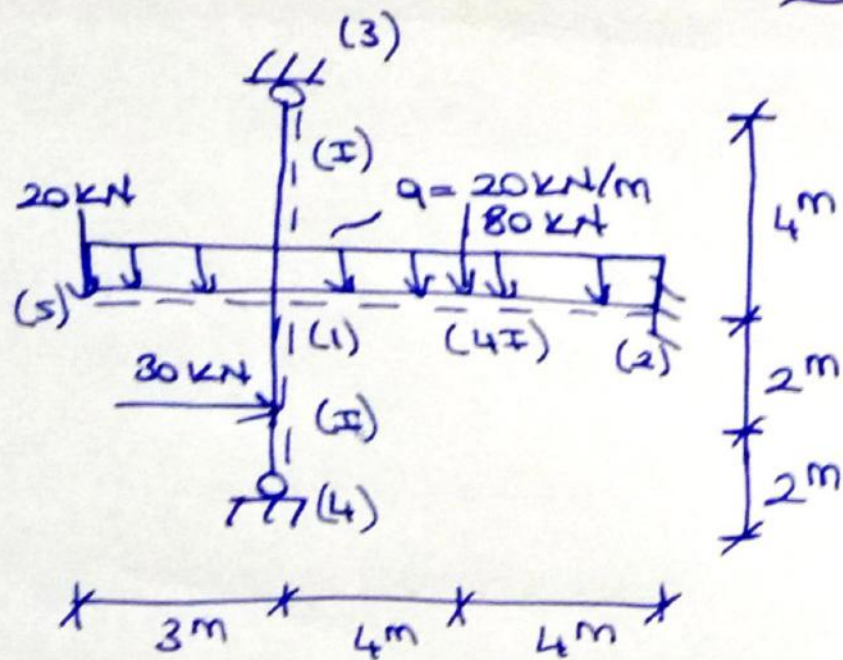


AĞI YÖNTEMİ



Ankastrelik Uç Momentleri

$$w_{12} = -w_{21} = \frac{ql^2}{12} + \frac{Pl}{8} = \frac{20 \times 8^2}{12} + \frac{80 \times 8}{8} = 186,67 \text{ kNm}$$

$$w_{15} = -\left(20 \times 3 + \frac{20 \times 3^2}{2}\right) = -150 \text{ kNm}$$

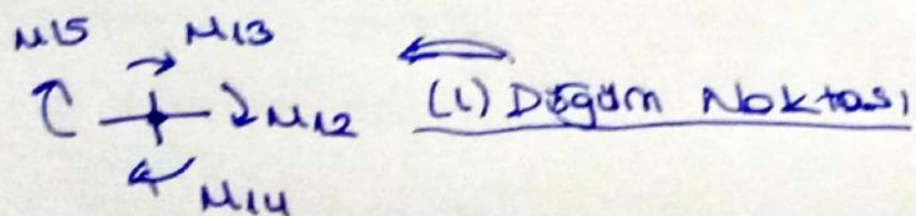
$$w_{14} = -\frac{3}{16} Pl = -\frac{3 \times 30 \times 4}{16} = -22,5 \text{ kNm}$$

Birim Deplasman Sabitleri

$$M_{12}^{Q_1} = \frac{4E(4I)}{8} = 2EI$$

$$M_{14}^{Q_1} = \frac{3EI}{4} = 0,75EI$$

$$M_{13}^{Q_1} = \frac{3EI}{4} = 0,75EI$$



$$M_{12} = w_{12} + M_{12}^{Q_1} \cdot Q_1 = 186,67 + 2EI Q_1$$

$$M_{14} = w_{14} + M_{14}^{Q_1} \cdot Q_1 = -22,5 + 0,75EI Q_1$$


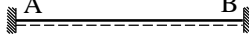
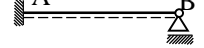
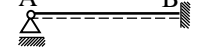

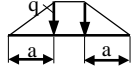
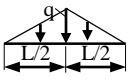
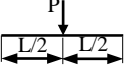
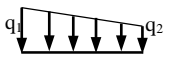
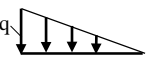
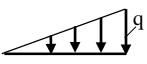
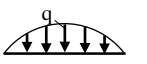
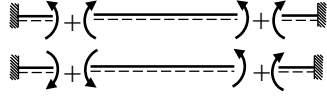
$$M_{13} = w_{13} + M_{13}^{Q_1} \cdot Q_1 = 0 + 0,75EI Q_1$$

$$M_{15} = -(20 \times 3 \times 1,5 + 20 \times 3) = -150 \text{ kNm}$$

$$\sum M_1 = 0 \rightarrow Q_1 = -4,05/EI$$

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		ÇİZELGE 2.4.1 ANKASTRELİK UÇ MOMENTLERİ			
					
Yük Şekli		\mathcal{M}_A	\mathcal{M}_B	$\overline{\mathcal{M}}_A$	$\overline{\mathcal{M}}_B$
1		$-\frac{qL^2}{12}$	$-\frac{qL^2}{12}$	$-\frac{qL^2}{8}$	$-\frac{qL^2}{8}$
2		$-\frac{qL^2}{12} [1 - \alpha^2 (2 - \alpha)]$	$-\frac{qL^2}{12} [1 - \alpha^2 (2 - \alpha)]$	$-\frac{qL^2}{8} [1 - \alpha^2 (2 - \alpha)]$	$-\frac{qL^2}{8} [1 - \alpha^2 (2 - \alpha)]$
3		$-\frac{5}{96} qL^2$	$-\frac{5}{96} qL^2$	$-\frac{5}{64} qL^2$	$-\frac{5}{64} qL^2$
4		$-\frac{1}{8} PL$	$-\frac{1}{8} PL$	$-\frac{3}{16} PL$	$-\frac{3}{16} PL$
5		$-\frac{L^2}{60} (3q_1 + 2q_2)$	$-\frac{L^2}{60} (2q_1 + 3q_2)$	$-\frac{L^2}{120} (8q_1 + 7q_2)$	$-\frac{L^2}{120} (7q_1 + 8q_2)$
6		$-\frac{1}{20} qL^2$	$-\frac{1}{30} qL^2$	$-\frac{1}{15} qL^2$	$-\frac{7}{120} qL^2$
7		$-\frac{1}{30} qL^2$	$-\frac{1}{20} qL^2$	$-\frac{7}{120} qL^2$	$-\frac{1}{15} qL^2$
8		$-\frac{1}{15} qL^2$	$-\frac{1}{15} qL^2$	$-\frac{1}{10} qL^2$	$-\frac{1}{10} qL^2$
$\alpha = a/L, \quad \beta = b/L,$ $\gamma = c/L$		Çizelgedeki pozitif yönlere Cross ve Açılı yöntemi pozitif yönlere			

Uç Momentleri

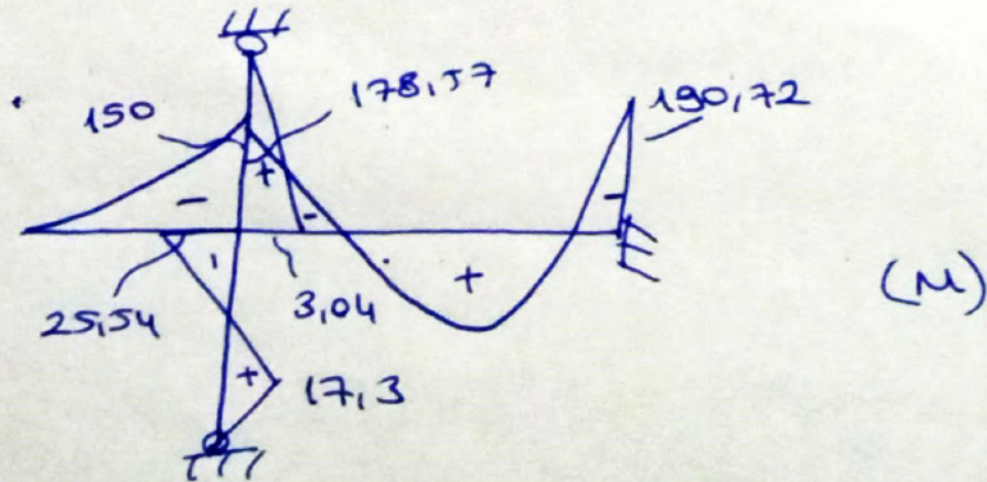
$$M_2 = 186,67 + 2EI \left(-\frac{4,05}{EI} \right) = 178,57 \text{ kNm}$$

$$M_{14} = -22,5 + 0,75EI \left(-\frac{4,05}{EI} \right) = -25,54 \text{ kNm}$$

$$M_{13} = 0,75EI \left(-\frac{4,05}{EI} \right) = -3,04 \text{ kNm}$$

$$M_{15} = -150 \text{ kNm}$$

$$M_{21} = w_{21} + M_{22} \cdot \theta_1 = -186,67 + \frac{2EI}{8} \cdot \left(-\frac{4,05}{EI} \right) = -190,72 \text{ kNm}$$



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