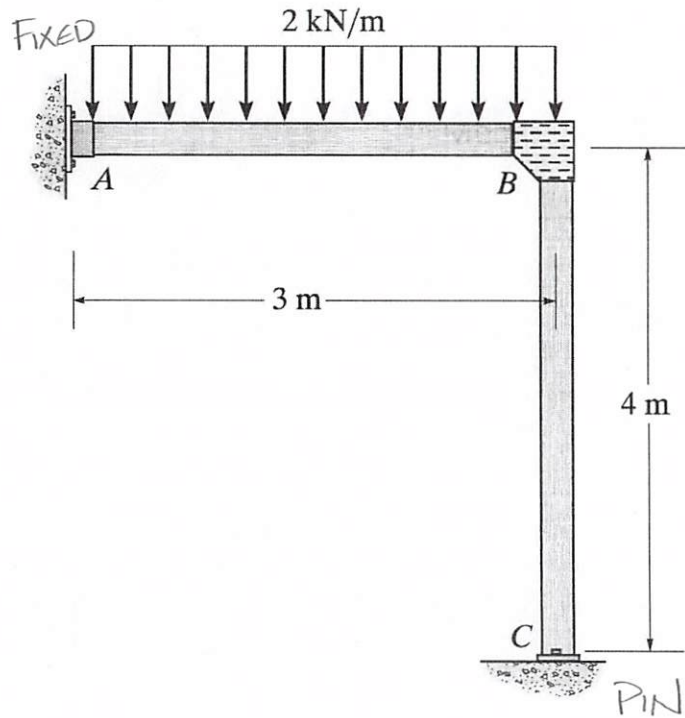


Problem 11b-1 – Determine the moment at B , then draw the moment diagram for each member of the frame. Assume the support at A is fixed, and C is pinned. EI is constant.

1/3



Joint	A	B		C
Member	AB	BA	BC	CB
DF	0	0.64	0.36	1
FEM	-1.5	1.5		
Dist.		-0.96	-0.54	
CO	-0.48			
Dist.				
	-1.98	0.54	-0.54	0

kNm

$$FEM_{AB} = \frac{WL^2}{12} = \frac{2 \text{ kN/m}(3 \text{ m})^2}{12} = \pm 1.5 \text{ kNm}$$

$$DF_{AB} = 0 \quad DF_{CB} = 1$$

$$K_{BA} = \frac{4EI}{3 \text{ m}}$$

$$K_{BC} = \frac{3EI}{4 \text{ m}}$$

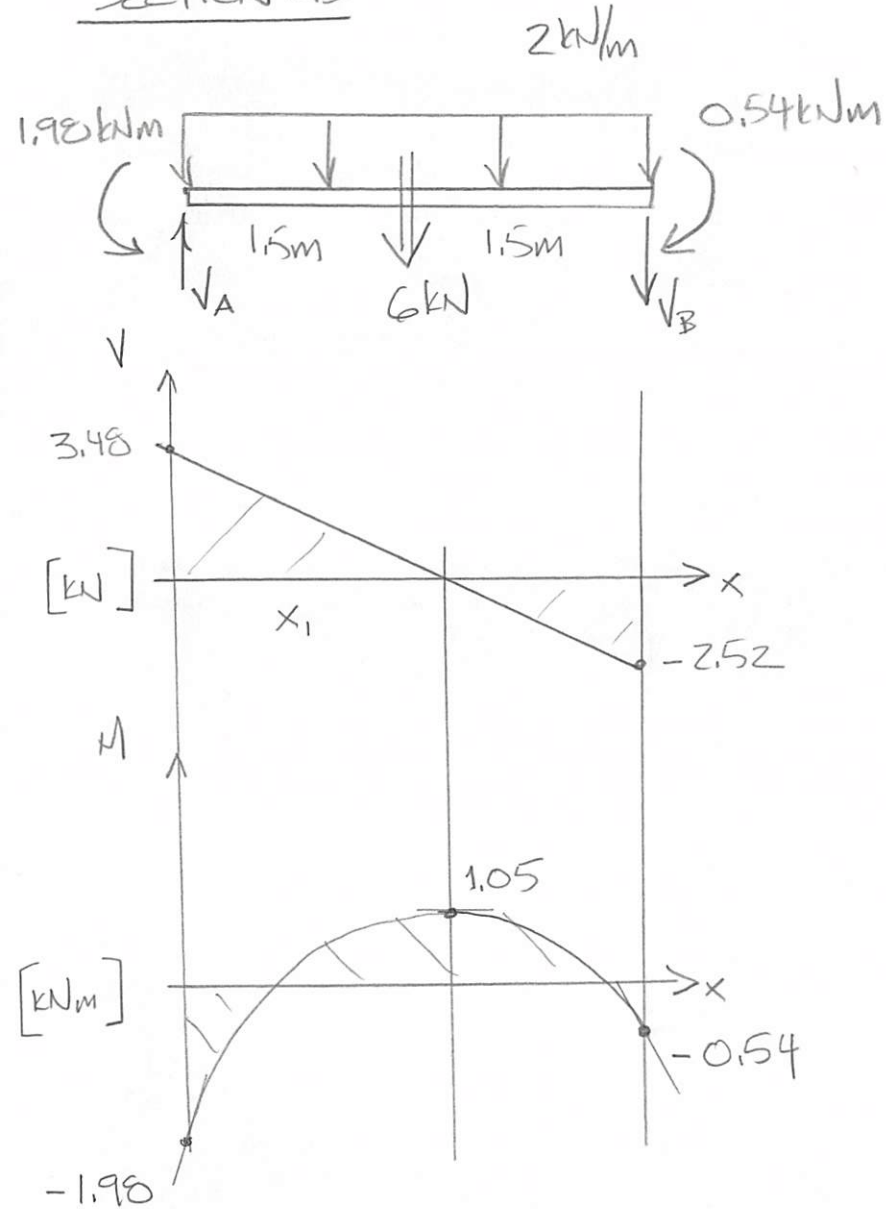
$$DF_{BA} = \frac{K_{BA}}{K_{BA} + K_{BC}} = \frac{4/3}{4/3 + 3/4} = 0.64$$

$$\underline{DF_{BC} = 0.36}$$

Problem 11b-1 – Determine the moment at B, then draw the moment diagram for each member of the frame. Assume the support at A is fixed, and C is pinned. EI is constant.

2/3

SECTION AB



$$\sum M_B = 0 = 1.98 \text{ kNm} - 0.54 \text{ kNm} + 6 \text{ kN}(1.5 \text{ m}) - V_A(3 \text{ m})$$

$$V_A = 3.48 \text{ kN}$$

$$\sum F_y = 0 = V_A - V_B - 6 \text{ kN}$$

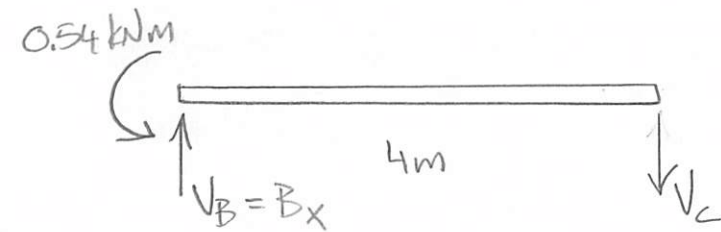
$$V_B = -2.52 \text{ kN} = B_y$$

$$x_1 = \frac{3.48 \text{ kN}}{2 \text{ kN/m}} = 1.74 \text{ m}$$

Problem 11b-1 – Determine the moment at B , then draw the moment diagram for each member of the frame. Assume the support at A is fixed, and C is pinned. EI is constant.

3/3

SECTION BC



$$\sum M_C = 0 = 0.54 \text{ kNm} - V_B(4\text{m})$$

$$\underline{V_B = 0.135 \text{ kN}}$$

$$+\uparrow \sum F_y = 0 = V_B - V_C$$

$$\underline{V_C = 0.135 \text{ kN}}$$

