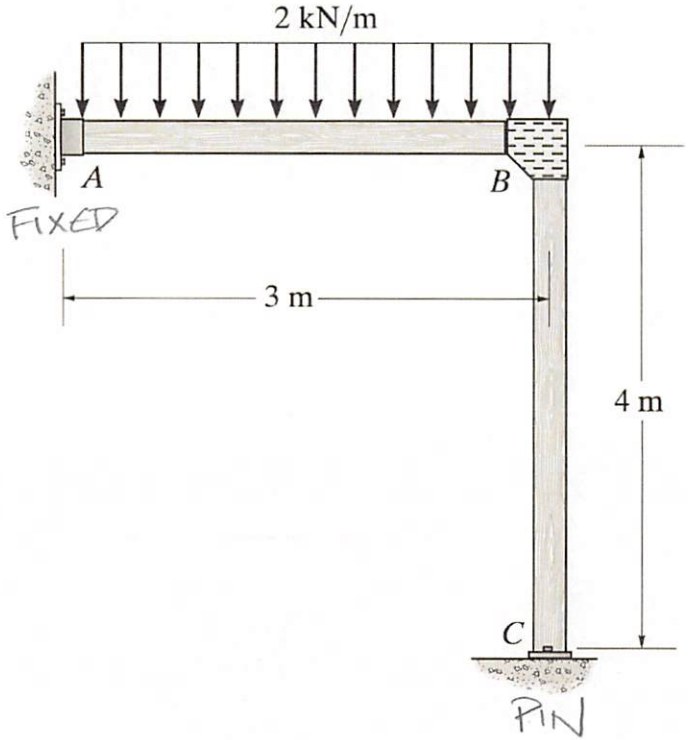
Problem 11b-1 – Determine the moment at *B*, then draw the moment diagram for each member of the frame. Assume the support at *A* is fixed and *C* is pinned. *EI* is constant.



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

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

$$K_{BA} = \frac{4EI}{L_{AB}} = \frac{4EI}{3m} \qquad K_{BC} = \frac{3EI}{L_{BC}} = \frac{3EI}{4m}$$

$$DF_{BA} = \frac{K_{BA}}{K_{BA}+K_{BC}} = \frac{4/3}{4/3+3/4} = 0.64 \qquad DF_{BC} = 0.36$$

JOINT	A	B		C
MEMBERS	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,				
Σ	-1.98	0.54	-0.54	0

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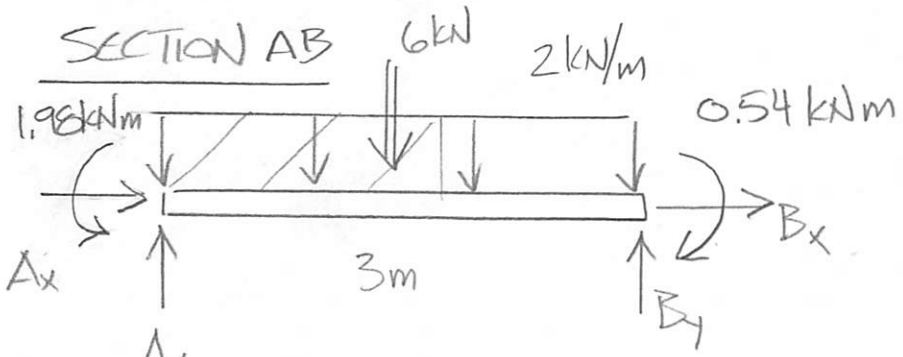
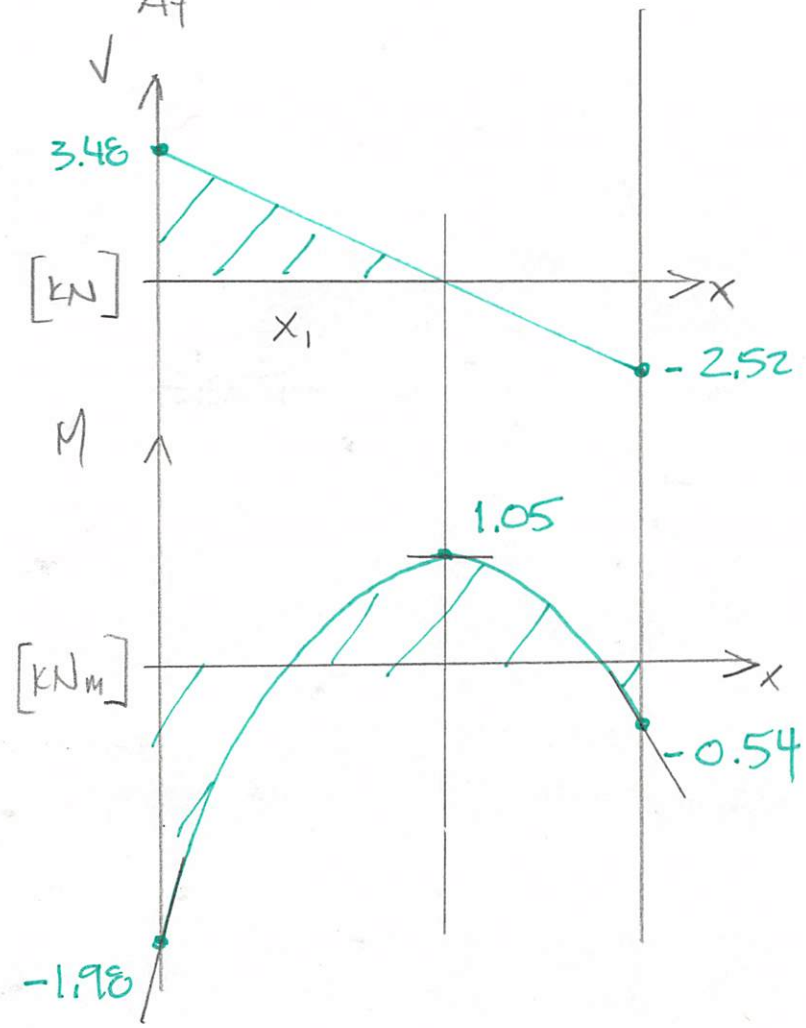


$$\circlearrowleft + \Sigma M_B = 0 = -0.54\,kNm + 6\,kN(1.5m) + 1.98\,kNm - A_y(3m)$$

$$\underline{A_y = 3.48\,kN}$$

$$+\uparrow \Sigma F_y = 0 = A_y + B_y - 6kN$$

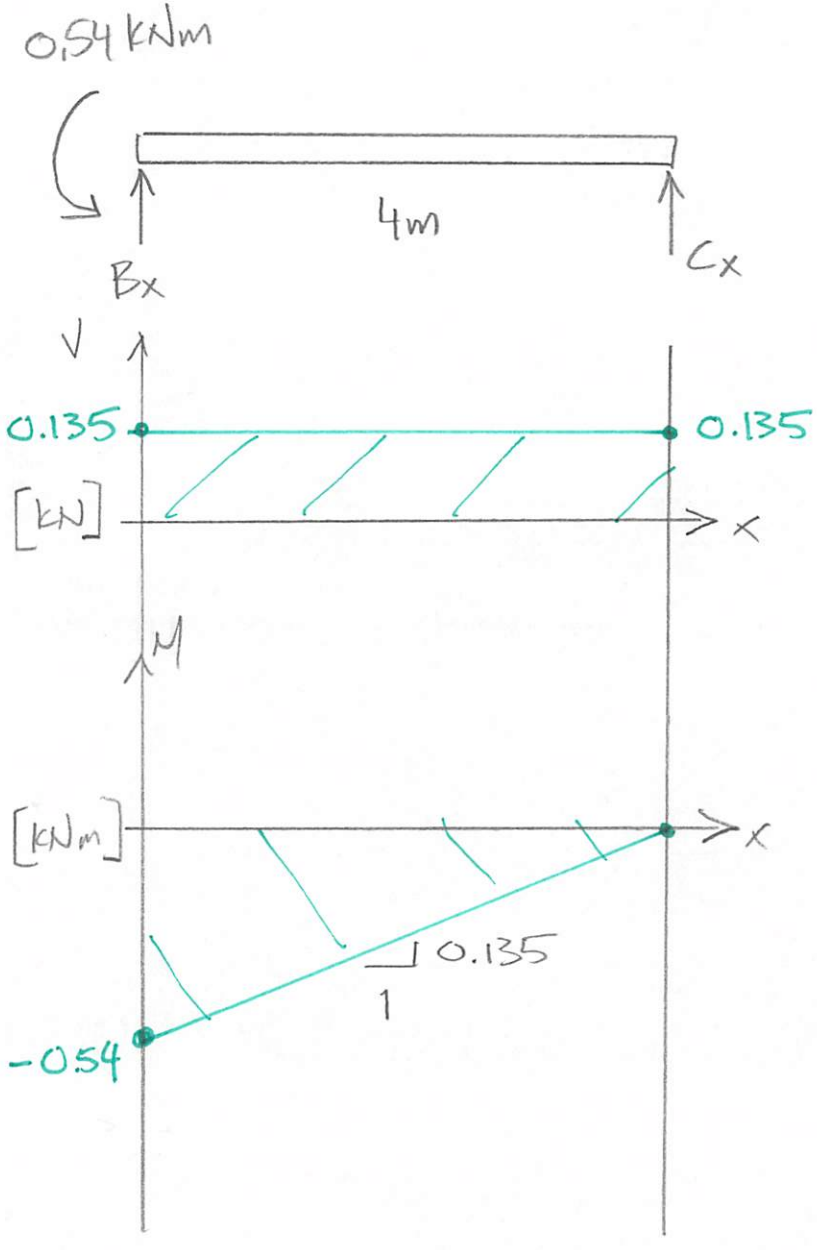
$$\underline{B_y = 2.52\,kN}$$



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

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.

SECTION BC



$$\circlearrowleft + \sum M_C = 0 = 0.54\,\text{kNm} - B_x(4\,\text{m})$$

$$B_x = 0.135\,\text{kN}$$

$$+\uparrow \sum F_x = 0 = B_x + C_x$$

$$C_x = -0.135\,\text{kN}$$