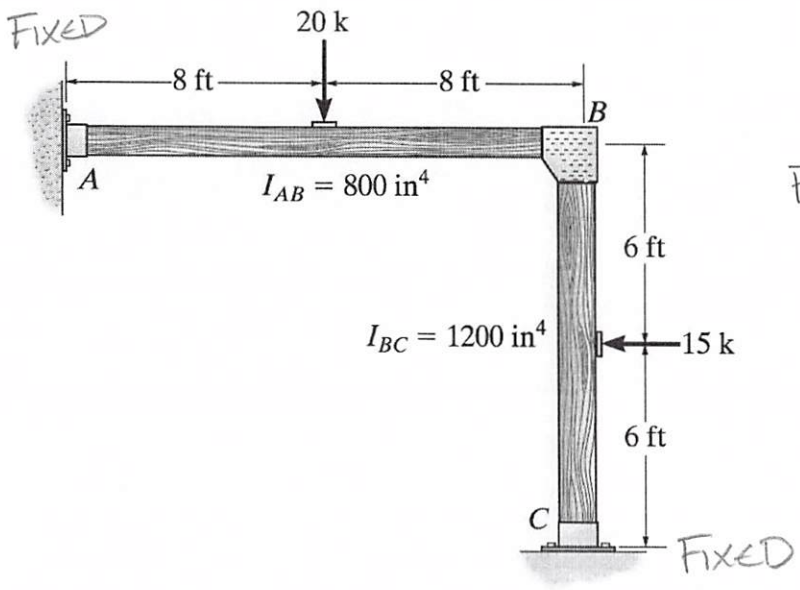
11b-2 – Determine the moments at the supports, then draw the moment diagram. The members are fixed connected at the supports and joint *B*. The moment of inertia of each member is given in the figure. Take $E = 29(10^3)$ ksi.



$$FEM_{AB} = \frac{PL}{8} = \frac{20^k(16')}{8} = \pm 40 k\text{-ft}$$

$$FEM_{BC} = \frac{PL}{8} = \frac{15^k(12')}{8} = \pm 22.5 k\text{-ft}$$

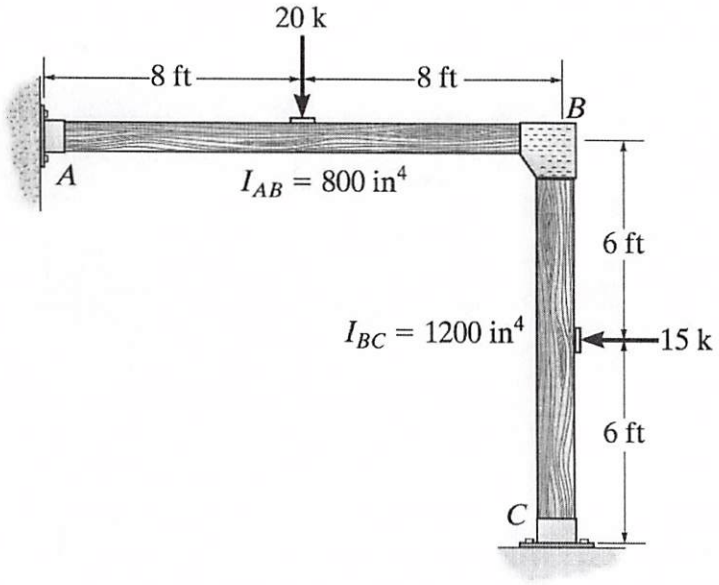
$DF_{AB} = 0$ $DF_{CB} = 0$ $I_{BC} = \frac{3}{2} I_{AB}$

$$K_{BA} = \frac{4EI_{AB}}{16'} \qquad K_{BC} = \frac{4EI_{BC}}{12'} = \frac{4E(3/2\, I_{AB})}{12'}$$

$$DF_{BA} = \frac{K_{BA}}{K_{BA} + K_{BC}} = \frac{1/4}{1/4 + 1/2} = 1/3$$

$$DF_{BC} = 2/3$$

Problem 11b-2 – Determine the moments at the supports, then draw the moment diagram. The members are fixed connected at the supports and joint *B*. The moment of inertia of each member is given in the figure. Take $E = 29(10^3)$ ksi.

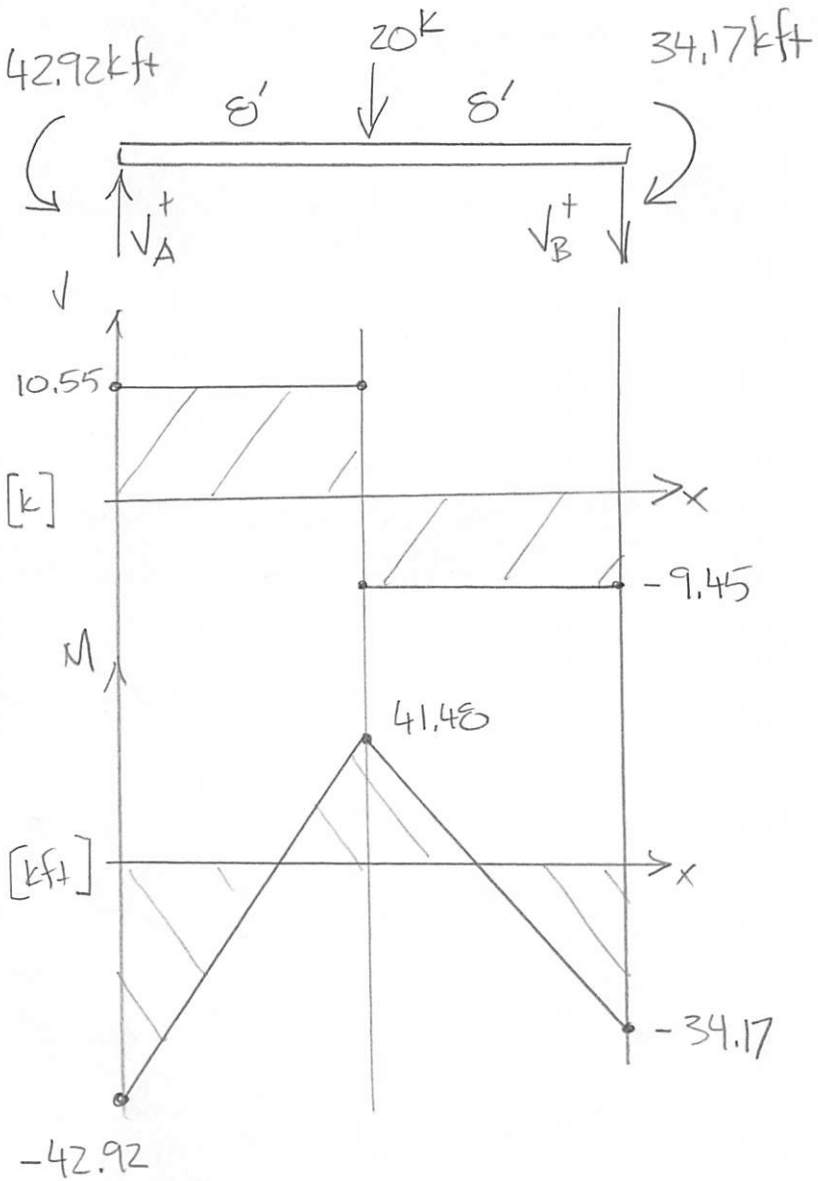


Joint	A	B		C
Member	AB	BA	BC	CB
DF	0	1/3	2/3	0
FEM	-40	40	-22.5	22.5
Dist.		-5.83	-11.67	
CO	-2.92			-5.84
Dist.				
	-42.92	34.17	-34.17	16.67

kft

Problem 11b-2 – Determine the moments at the supports, then draw the moment diagram. The members are fixed connected at the supports and joint *B*. The moment of inertia of each member is given in the figure. Take $E = 29(10^3)$ ksi.

SECTION AB



$$\circlearrowleft^{+} \sum M_B = 0 = 42.92\text{kft} - 34.17\text{kft} + 20\text{k}(8') - V_A(16')$$

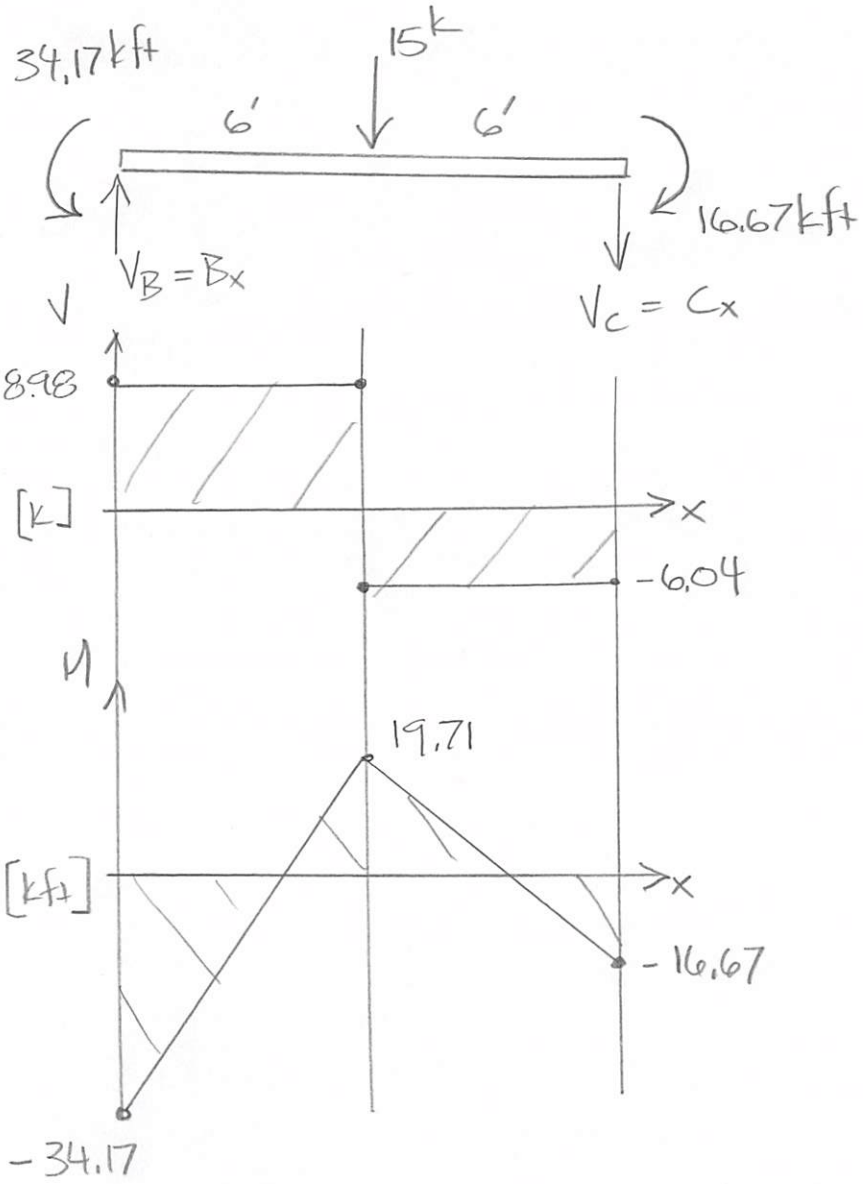
$$V_A = 10.55\text{k}$$

$$+\uparrow \sum F_y = 0 = V_A - V_B - 20^{\text{k}}$$

$$V_B = -9.45^{\text{k}}$$

Problem 11b-2 – Determine the moments at the supports, then draw the moment diagram. The members are fixed connected at the supports and joint *B*. The moment of inertia of each member is given in the figure. Take $E = 29(10^3)$ ksi.

SECTION BC



$$\circlearrowleft + \sum M_C = 0 = 34.17\,\text{kft} - 16.67\,\text{kft} + 15^k(6') - V_B(12')$$

$$V_B = 8.96k$$

$$+\uparrow \sum F_y = 0 = V_B - V_C - 15^k$$

$$V_C = -6.04k$$