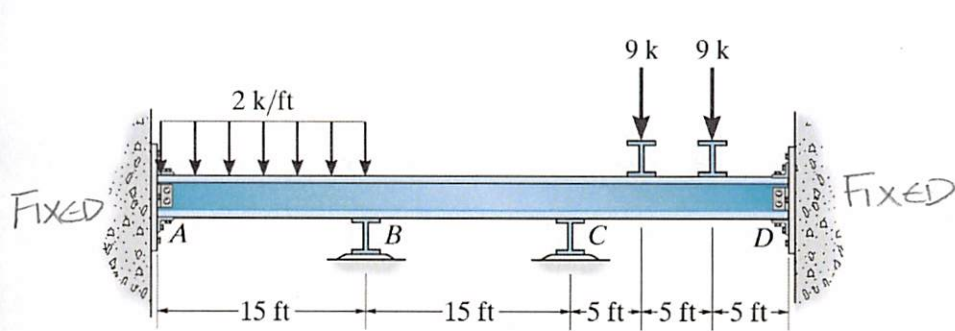


Problem 11a-2 – Determine the moments at A, B, C, and D. Assume the supports at A and D are fixed and B and C are rollers. EI is constant.



$$FEM_{AB} = \pm \frac{WL^2}{12} = \pm \frac{2k/ft(15ft)^2}{12} = \pm 37.5 \text{ kft}$$

$$FEM_{CD} = \pm \frac{2PL}{9} = \pm \frac{2(9k)15ft}{9} = \pm 30 \text{ kft}$$

$$DF_{AB} = 0 \text{ (FIXED)} \quad DF_{DC} = 0 \text{ (FIXED)}$$

$$\frac{JOINT B}{K_{BA}} = \frac{4EI}{L_{AB}} = \frac{4EI}{15'}$$

$$K_{BC} = \frac{4EI}{L_{BC}} = \frac{4EI}{15'}$$

$$\left[\begin{aligned} DF_{BA} &= \frac{K_{BA}}{K_{BA} + K_{BC}} = \frac{4/15}{4/15 + 4/15} = 1/2 \\ DF_{BC} &= 1/2 \end{aligned} \right.$$

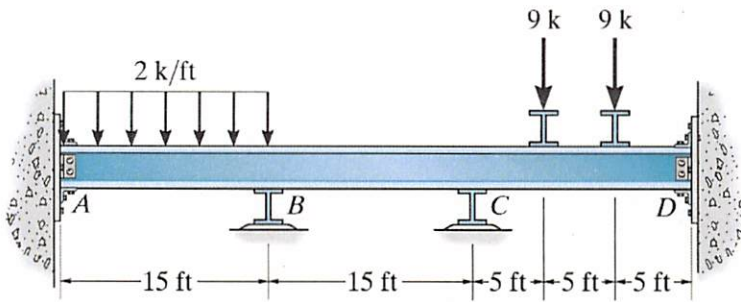
JOINT C

$$K_{CB} = \frac{4EI}{L_{BC}} = \frac{4EI}{15'}$$

$$K_{CD} = \frac{4EI}{L_{CD}} = \frac{4EI}{15'}$$

$$DF_{CB} = DF_{CD} = 1/2$$

Problem 11a-2 – Determine the moments at A, B, C, and D. Assume the supports at A and D are fixed and B and C are rollers. EI is constant.



Joint	A	B		C		D
Member	AB	BA	BC	CB	CD	DC
DF	○	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	○
FEM	-37.5	37.5			-30	30
Dist.		-18.75	-18.75	15	15	
CO	-9.375		7.5	-9.375		7.5
Dist.		-3.75	-3.75	4.6875	4.6875	
CO	-1.875		2.3438	-1.875		2.3438
Dist.		-1.1719	-1.1719	0.9375	0.9375	
CO	-0.586		0.469	-0.586		0.469
Dist.		-0.235	-0.235	0.293	0.293	
CO	-0.118		0.147	-0.118		0.147
Dist.		-0.073	-0.073	0.059	0.059	

$$\sum \quad -49.45 \quad 13.52 \quad -13.52 \quad 9.02 \quad -9.02 \quad 40.46 \quad (\text{kft})$$