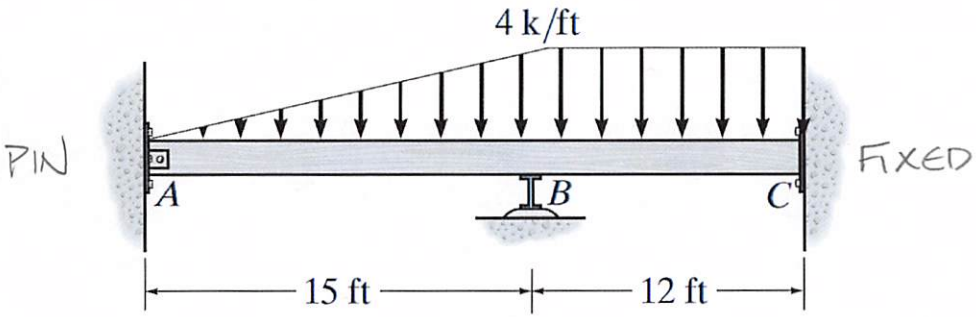
**Problem 11a-1** – Determine the moment at *B*. Assume the support at *A* is pinned, *B* is a roller, *C* is fixed, and *EI* is constant.




$$FEM_{BA} = \frac{WL^2}{15} = \frac{4k/ft(15')^2}{15} = 60 k\,ft$$

$$FEM_{BC} = \pm\frac{WL^2}{12} = \pm\frac{4k/ft(12)^2}{12} = \pm 48 k\,ft$$

DF = 1

DF = 0

$$K_{BA} = \frac{3EI}{L} = \frac{3EI}{15'} \qquad K_{BC} = \frac{4EI}{L} = \frac{4EI}{12'}$$

$$DF_{BA} = \frac{K_{BA}}{K_{BA}+K_{BC}} = \frac{1/5}{1/5+1/3} = 0.375$$

$$DF_{BC} = \frac{K_{BC}}{K_{BA}+K_{BC}} = \frac{1/3}{1/5+1/3} = 0.625$$

| JOINT | A | B | | C |
|---|---|---|---|---|
| MEMBER | AB | BA | BC | CB |
| DF | 1 | 0.375 | 0.625 | 0 |
| FEM | 0 | 60 | -48 | 48 |
| DIS | | -4.5 | -7.5 | |
| CO | | | | -3.75 |
| DIS | | | | |
| $\Sigma$ | 0 | 55.5 | -55.5 | 44.25 |