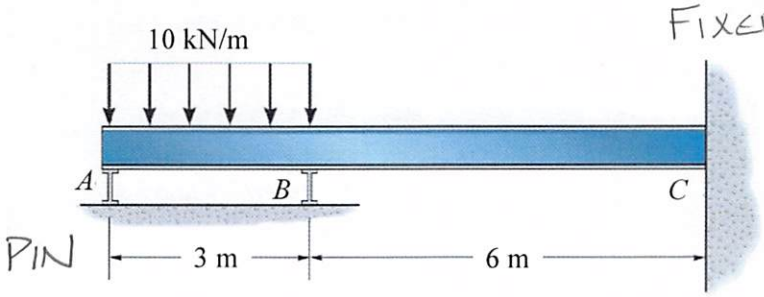
**CIVL 4122 Quiz #4 F24** Name: _____

Determine the moments at *B* and *C*. Assume *A* and *B* are rollers, *C* is fixed, and *EI* is constant.




$$FEM_{BA} = \frac{WL^2}{8} = \frac{(10\,kNm)(3m)^2}{8}$$

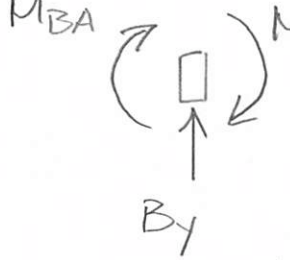
$$= 11.25\,kNm$$

$$M_{BA} = \frac{3EI}{3m}\left[\theta_B\right] + 11.25\,kNm \quad (1)$$

$$M_{BC} = \frac{2EI}{6m}\left[2\theta_B\right] \quad (2)$$

$$M_{CB} = \frac{2EI}{6m}\left[\theta_B\right] \quad (3)$$

JOINT B




$$\sum M_B = 0$$

$$= -M_{BA} - M_{BC}$$

$$M_{BA} + M_{BC} = 0 \quad (4)$$

$$(4)\; M_{BA} + M_{BC} = 0 = \frac{3EI}{3m}\left[\theta_B\right] + 11.25kNm + \frac{2EI}{6m}\left[2\theta_B\right]$$

$$\frac{5}{3}\theta_B = -\frac{11.25kNm^2}{EI} \qquad \theta_B = -\frac{6.75kNm^2}{EI}$$

$$M_{BA} = \frac{3EI}{3m}\left[\theta_B\right] + 11.25\,kNm = \underline{4.50\,kNm}$$

$$M_{BC} = \frac{2EI}{6m}\left[2\theta_B\right] = \underline{-4.50kNm}$$

$$M_{CB} = \frac{2EI}{6m}\left[\theta_B\right] = \underline{-2.25kNm}$$