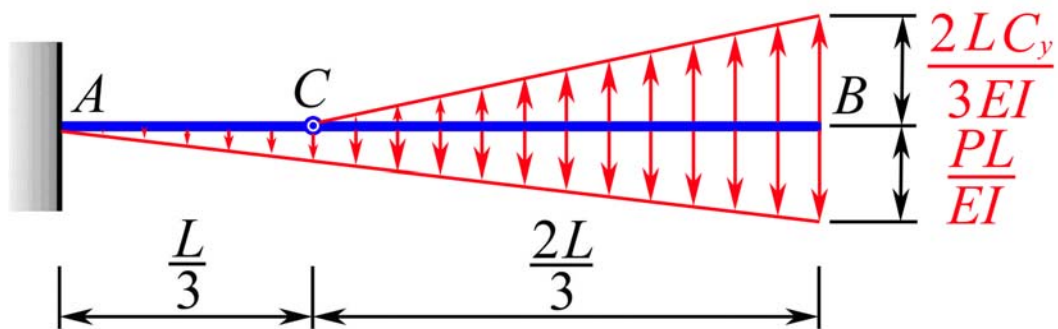
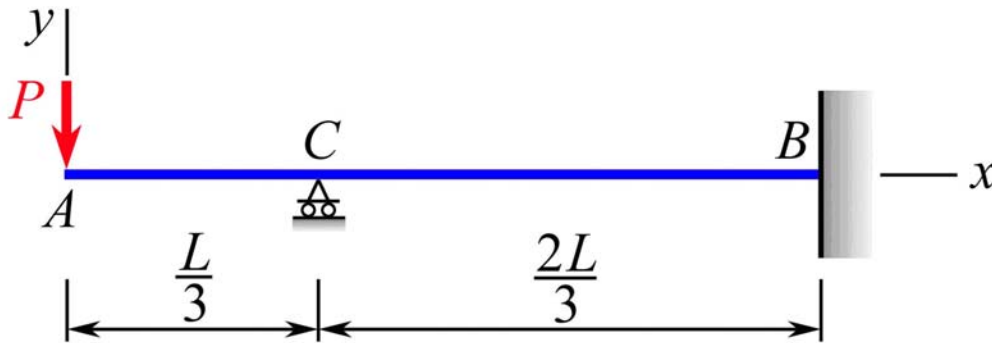


MEEG 3013 [Quiz #10.m26.072](#)

The beam shown has a constant EI . Using *conjugate beam method*, determine (a) the reaction C_y at C , (b) the slope θ_A at A .



④

① Zero moment at hinge C of conjugate beam: $M_C^c = 0$:

$$\frac{4L}{9} \left[\frac{1}{2} \left(\frac{2L}{3} \right) \left(\frac{2C_y L}{3EI} \right) \right] - \frac{L}{3} \left[\frac{2L}{3} \left(\frac{PL}{3EI} \right) \right] - \frac{4L}{9} \left[\frac{1}{2} \left(\frac{2L}{3} \right) \left(\frac{2PL}{3EI} \right) \right] = 0$$

$$C_y = \frac{7P}{4} \quad \mathbf{C_y = \frac{7P}{4} \uparrow} \quad \text{③}$$

② Shearing force at A in conjugate beam: $V_A^c = \theta_A$:

$$V_A^c = -\frac{1}{2} \left(\frac{2L}{3} \right) \left(\frac{2C_y L}{3EI} \right) + \frac{1}{2} (L) \left(\frac{PL}{EI} \right) = \frac{PL^2}{9EI}$$

$$\mathbf{\theta_A = \frac{PL^2}{9EI}} \quad \text{③}$$