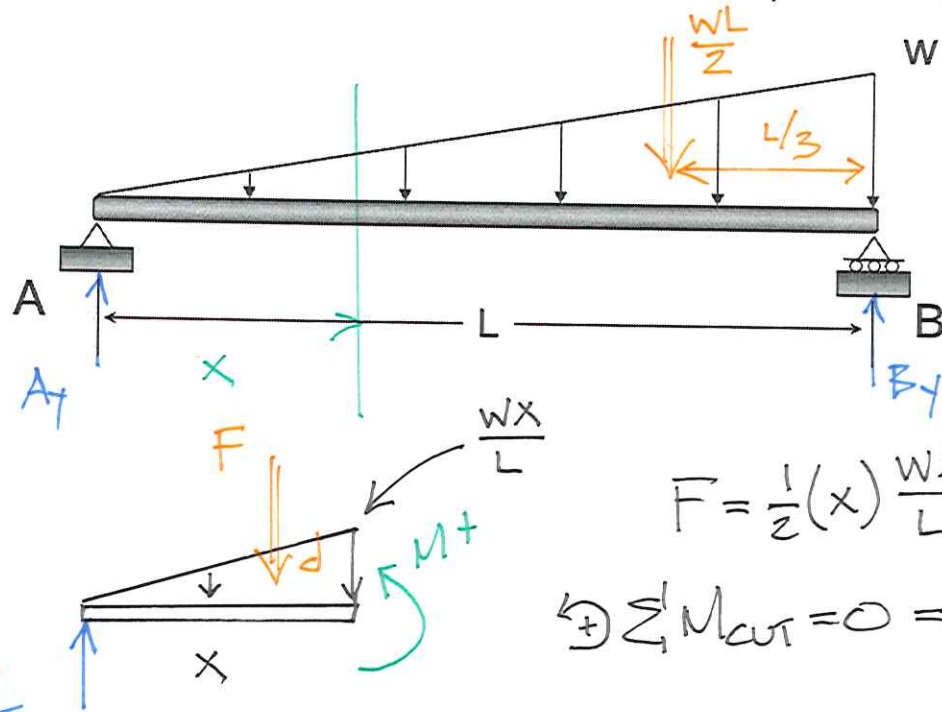


Example 7a-2: Determine the equations for slope and displacement in the following beam.



$$\sum M_B = 0 = \frac{WL}{2} \left(\frac{L}{3} \right) - A_y(L) \quad A_y = \frac{WL}{6}$$

$$M(x=0) = 0 \quad \checkmark$$

$$M(x=L) = 0 \quad \checkmark$$

$$\sum M_{cut} = 0 = M + \frac{Wx^2}{2L} \left(\frac{x}{3} \right) - \frac{WL}{6}x \quad M(x) = \frac{W}{6} \left[-\frac{x^3}{L} + Lx \right]$$

$$\theta = \int \frac{M}{EI} dx = \frac{W}{6EI} \int \left(-\frac{x^3}{L} + Lx \right) dx = \frac{W}{6EI} \left(-\frac{x^4}{4L} + \frac{Lx^2}{2} \right) + \underline{C_1}$$

$$y = \int \theta dx = \frac{W}{6EI} \left[-\frac{x^5}{20L} + \frac{Lx^3}{6} \right] + \underline{C_1}x + \underline{C_2}$$

$$y(x=0) = 0 = C_2$$

$$y(x=L) = 0 = \frac{W}{6EI} \left[\frac{7L^4}{60} \right] + C_1L$$

$$\underline{C_1 = \frac{-7WL^3}{360EI}}$$