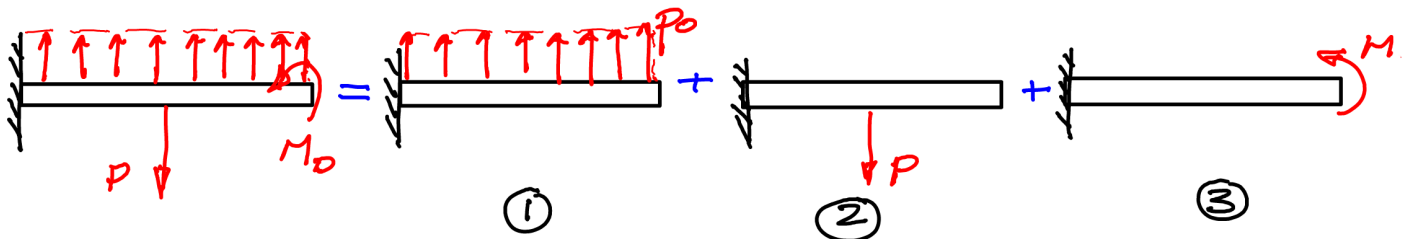
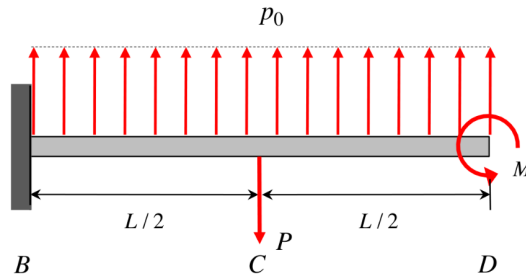


Example 11.17

Determine the deflection of the beam loaded as below using superposition.



$$V_1(x) = \frac{P_0 x^2}{24EI} [6L^2 - 4Lx + x^2]$$

$$V_2(x) = \begin{cases} -\frac{Px^2}{6EI} \left[\frac{3L}{2} - x \right] & ; \quad 0 < x < \frac{L}{2} \\ -\frac{PL^2}{24EI} \left[3x - \frac{L}{2} \right] & ; \quad \frac{L}{2} < x < L \end{cases}$$

$$V_3(x) = \frac{Mx^2}{2EI}$$

$$\therefore V(x) = V_1(x) + V_2(x) + V_3(x)$$

$$= \begin{cases} \frac{P_0 x^2}{24EI} [6L^2 - 4Lx + x^2] - \frac{Px^2}{6EI} \left[\frac{3L}{2} - x \right] + \frac{Mx^2}{2EI} & ; \quad 0 < x < \frac{L}{2} \\ \frac{P_0 x^2}{24EI} [6L^2 - 4Lx + x^2] - \frac{PL^2}{24EI} \left[3x - \frac{L}{2} \right] + \frac{Mx^2}{2EI} & ; \quad \frac{L}{2} < x < L \end{cases}$$