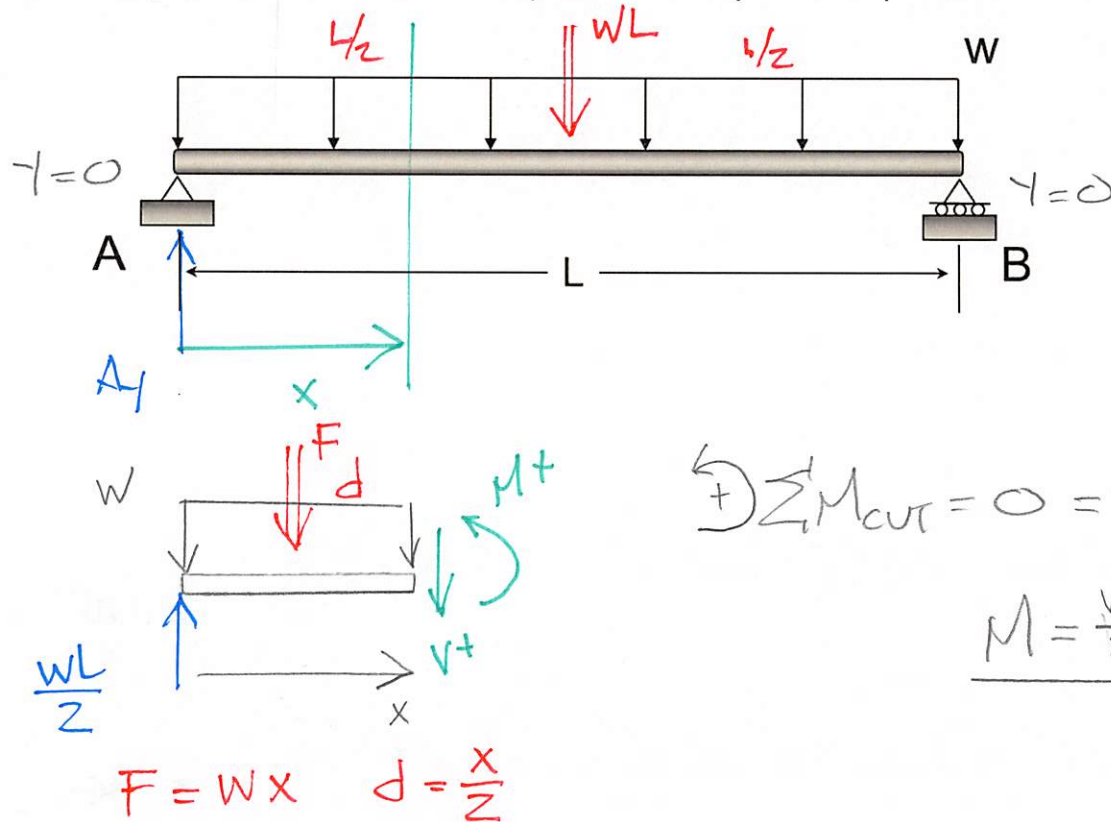


Example 7a-1: Determine the equations for slope and displacement in the following beam.



$$\sum M_B = 0 = wL\left(\frac{L}{2}\right) - A_1(L)$$

$$\underline{A_1 = \frac{wL}{2}}$$

$$\sum M_{cut} = 0 = M + (wx)\left(\frac{x}{2}\right) - \frac{wL}{2}(x)$$

$$\underline{M = \frac{w}{2}[-x^2 + Lx]}$$

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

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

$$EI\theta = \int M dx = \frac{w}{2} \left[-\frac{x^3}{3} + \frac{Lx^2}{2} \right] + C_1$$

$$y = \frac{1}{EI} \int \theta dx = \frac{w}{2EI} \left[-\frac{x^4}{12} + \frac{Lx^3}{6} \right] + \frac{C_1 x}{1} + \frac{C_2}{1}$$

$$y(x=0) = 0 = \underline{C_2}$$

$$y(x=L) = 0$$

$$\frac{wL^4}{24EI} + C_1 L = 0$$

$$\underline{C_1 = -\frac{wL^3}{24EI}}$$