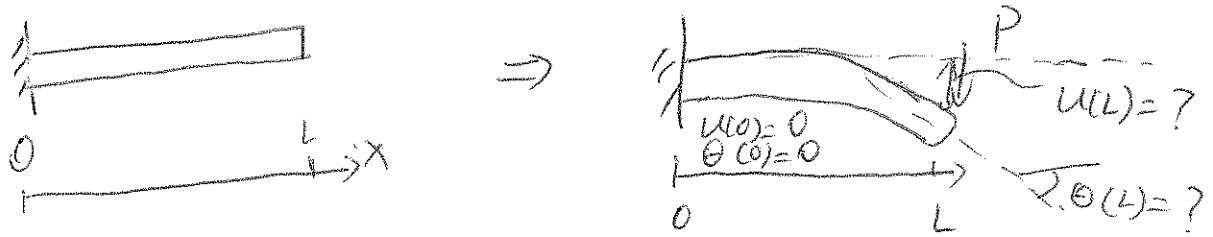
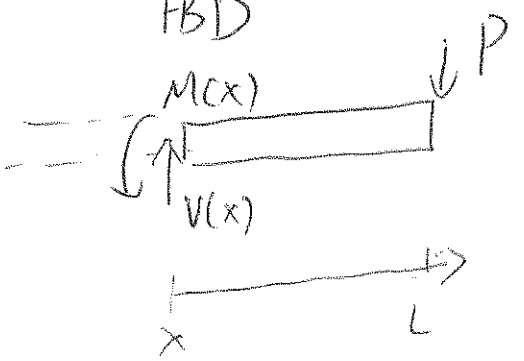
BJ 15.1



FBD



$$M(x) = -P(L-x)$$

Differential Equation

$$EI\,u'' = -P(L-x)$$

$$\Rightarrow EI\,u' = -PLx + \frac{1}{2}Px^2 + C_1$$

$$u'(0)=0 \Rightarrow C_1 = 0$$

$$\Rightarrow EI\,u = EI\int_0^x u'(x')\,dx' = -\frac{PLx^2}{2} + \frac{Px^3}{6} + C_2$$

$$u(0)=0 \Rightarrow C_2 = 0$$

$$\boxed{EI\,u(x) = -\frac{PLx^2}{2} + \frac{Px^3}{6}}$$

$$u(L) = -\frac{1}{3}PL^3/EI$$

$$u'(L) = -\frac{PL^2}{2EI}$$