



$$M_F(x) = \frac{M}{l} x_1$$

$$y_1'' E I = -\frac{M}{l} x_1$$

$$y_1' E I = -\frac{M}{l} \frac{x_1^2}{2} + A$$

$$y_1 E I = -\frac{M}{l} \frac{x_1^3}{6} + A x_1 + B$$

$$M_F(x_2) = M$$

$$y_2'' E I = -M$$

$$y_2' E I = -M x_2 + C$$

$$y_2 E I = -\frac{M x_2^2}{2} + C x_2 + D$$

$$y_1(0) = 0 \rightarrow B = 0$$

$$y_1(b) = y_2(0) \rightarrow -\frac{M b^2}{6} + A b = 0 \rightarrow A = \frac{M b}{6}$$

$$y_1'(b) = y_2'(0) \rightarrow -\frac{M b}{2} + A = C \rightarrow C = -\frac{M b}{3}$$

$$y_2(0) = 0 \rightarrow D = 0$$

$$y_1 = \left( -\frac{M x_1^3}{6l} + \frac{M b}{6} x_1 \right) \frac{1}{E I}$$

$$y_1' = \left( -\frac{M x_1^2}{2l} + \frac{M b}{6} \right) \frac{1}{E I}$$

$$y_2 = \left( -\frac{M x_2^2}{2} - \frac{M b}{3} x_2 \right) \frac{1}{E I}$$

$$y_2' = \left( -M x_2 - \frac{M b}{3} \right) \frac{1}{E I}$$

$$\text{MAX } |y_1| \Rightarrow y_1' = 0 \Rightarrow x_1 = \sqrt{\frac{Q^2}{3}}$$

$$\begin{aligned} y_1\left(\sqrt{\frac{Q^2}{3}}\right) &= \frac{Q^2}{\sqrt{3}} \frac{1}{ES} \left(-\frac{M}{18} + \frac{M}{6}\right) = \\ &= \frac{Q^2}{\sqrt{3}} \frac{1}{ES} \frac{M}{9} \end{aligned}$$

$$\text{MAX } |y_2| \Rightarrow x_2 = Q \Rightarrow$$

$$\boxed{y_2(Q) = -\frac{5}{6} \frac{Q^2 M}{ES}}$$

