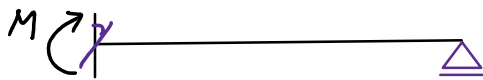


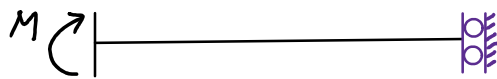
مقایسه سختی اعضاء با شرایط متفاوت تلبه گاهی



$k = \frac{4EI}{L}$

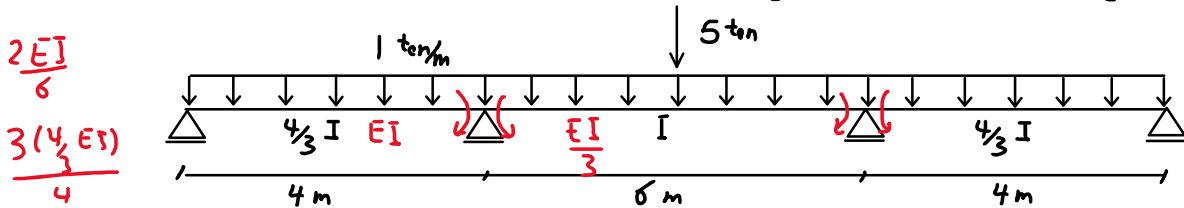


$k = \frac{3EI}{L}$

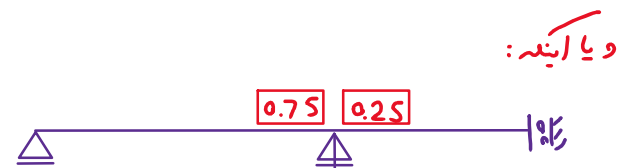
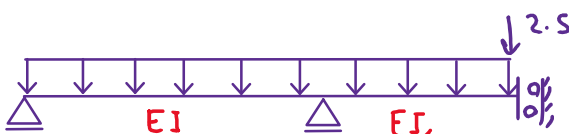
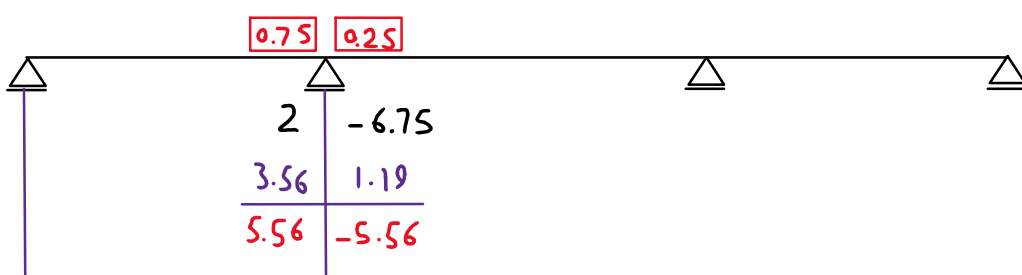


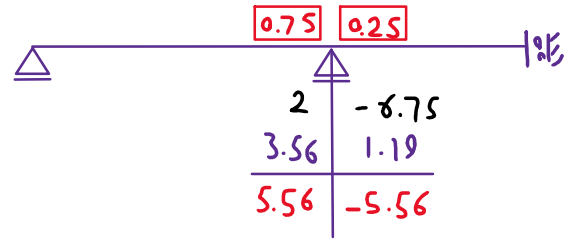
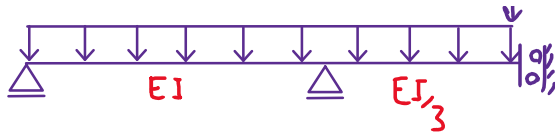
$k = \frac{EI}{L}$

مثال: گنرهای انتقایی اعضاء را به دست آورید.

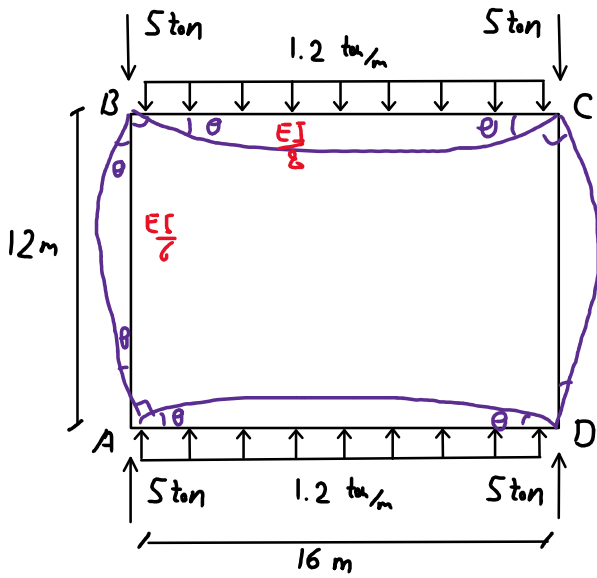


$\frac{1 \times 6^2}{12} + \frac{5 \times 6}{8} = 6.75$



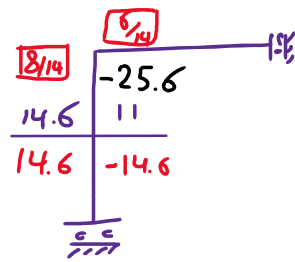


مثال: لنگردگره B و جرخش گره B را بدست آورید.



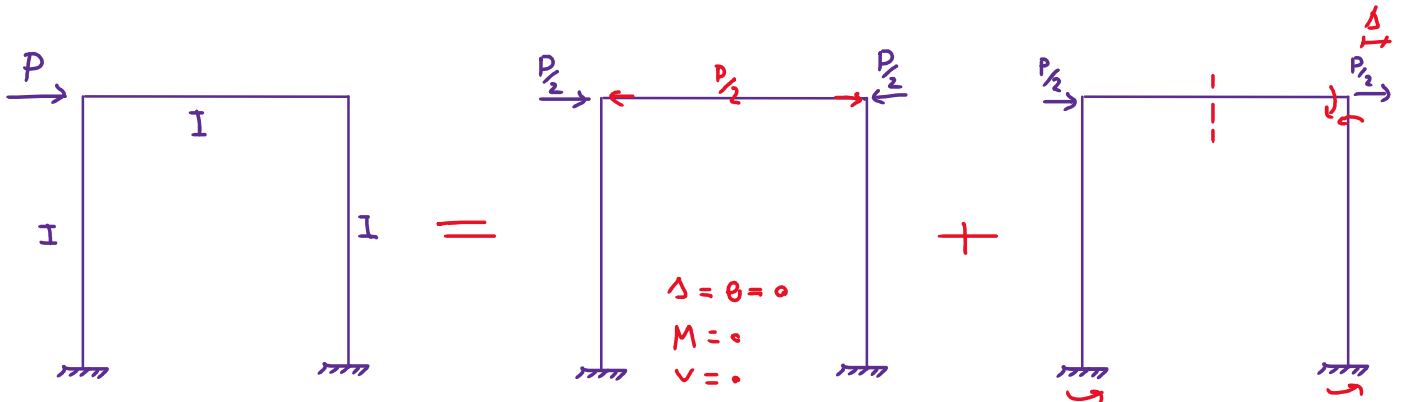
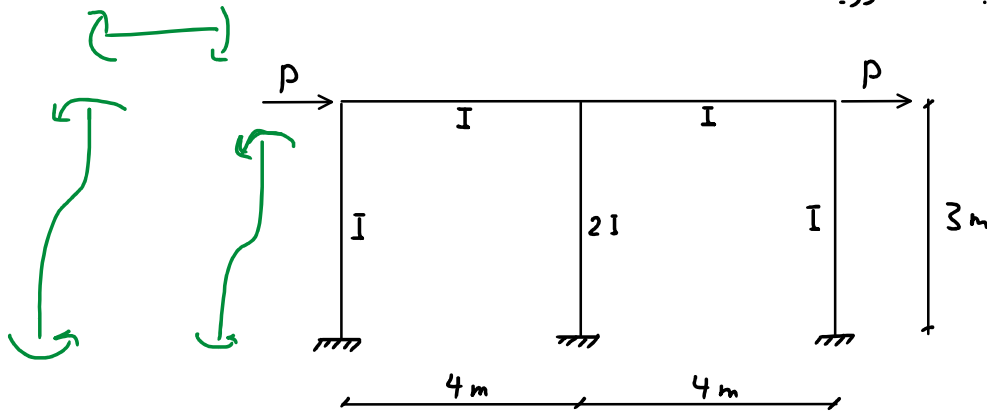
$$\theta_B = \frac{M}{\sum k_i} = \frac{\frac{1.2 \times 16^2}{12} \cdot 25.6}{\frac{2EI}{16} + \frac{2EI}{12}} = \frac{87.8}{EI}$$

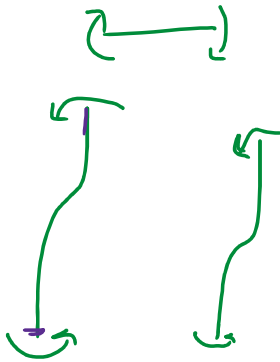
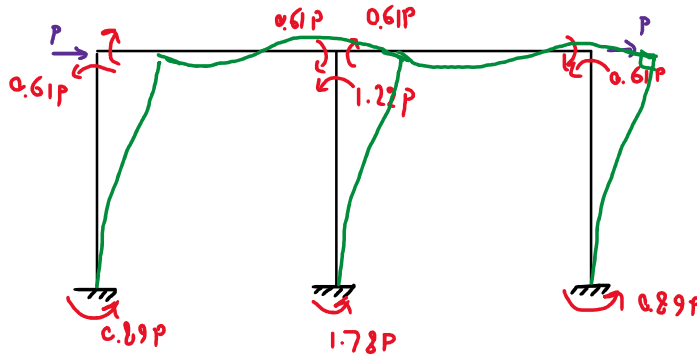
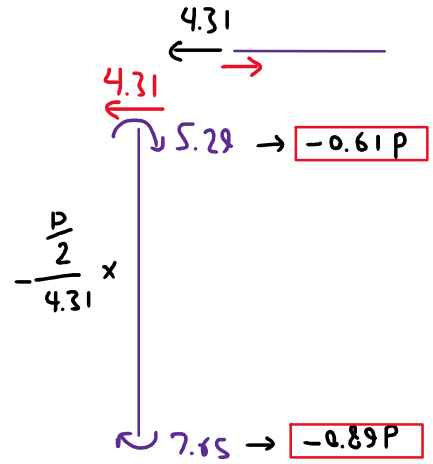
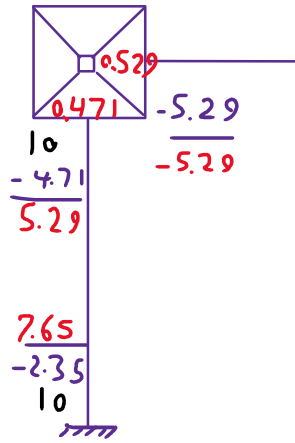
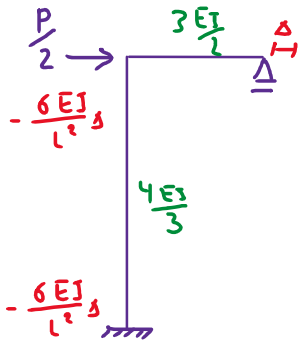
$$M_B = 25.6 \times \frac{8}{14} = 14.6$$



$$14.6 = \frac{2EI}{12} \theta \rightarrow \theta = \frac{87.6}{EI}$$

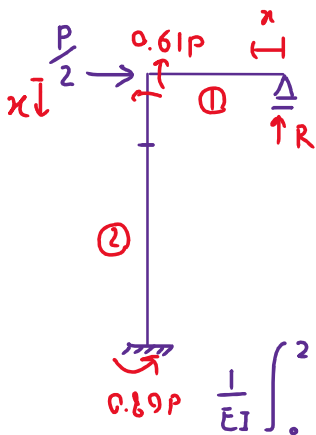
مثال: لنگرهای انتهایی اعضا را بدست آورید.





$$M = \frac{2EI}{L} (2\theta + \theta) \left(-\frac{3\Delta}{L} \right)$$

$$U = \frac{1}{2} \int \frac{M^2}{EI} dx$$



$$\delta_y = 0 \rightarrow \frac{\partial U}{\partial R} = 0 \rightarrow \int \frac{M}{EI} \left(\frac{\partial M}{\partial R} \right) dx = 0$$

$$\textcircled{1} M = Rx \quad \frac{\partial M}{\partial R} = x$$

$$\textcircled{2} M = 2R - \frac{P}{2}x \quad \frac{\partial M}{\partial R} = 2$$

$$\frac{1}{EI} \int_0^2 Rx^2 dx + \int_0^3 (4R - Px) dx = 0$$

$$R \frac{x^3}{3} \Big|_0^2 + \left(4Rx - \frac{Px^2}{2} \right) \Big|_0^3 = 0$$

$$\frac{8}{3}R + 12R - 4.5P = 0 \rightarrow$$

$$R = 0.307P$$

$$M = 0.61P$$