

$$\delta_0 = \int \frac{M \bar{m} ds}{EI} = -2 \int_0^{\pi/2} \frac{P}{2} \cdot R \cdot (1 - \cos \theta) \cdot R \sin \theta \, d\theta \cdot R / EI$$

$$\delta_0 = -\frac{PR^3}{EI} \int_0^{\pi/2} (1 - \cos \theta) \sin \theta \, d\theta$$

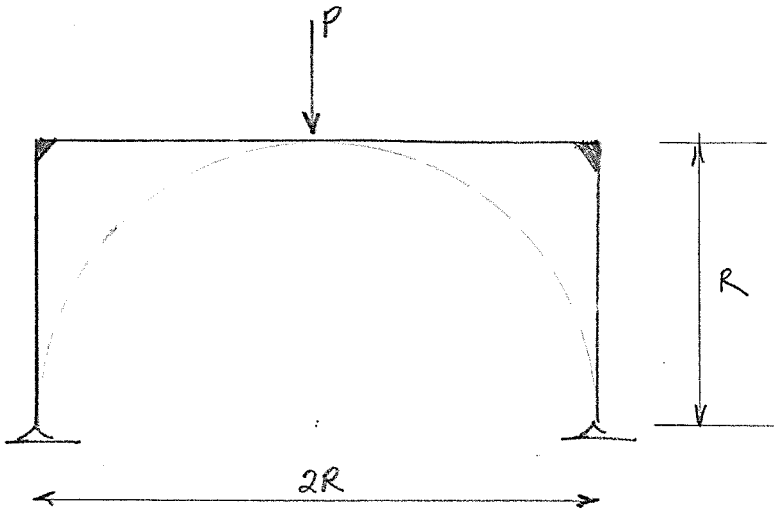
$$\delta_0 = -\frac{PR^3}{EI} \left[ \int_0^{\pi/2} \sin \theta \, d\theta - \int_0^{\pi/2} \cos \theta \sin \theta \, d\theta \right]$$

$$\delta_0 = -\frac{PR^3}{2EI}$$

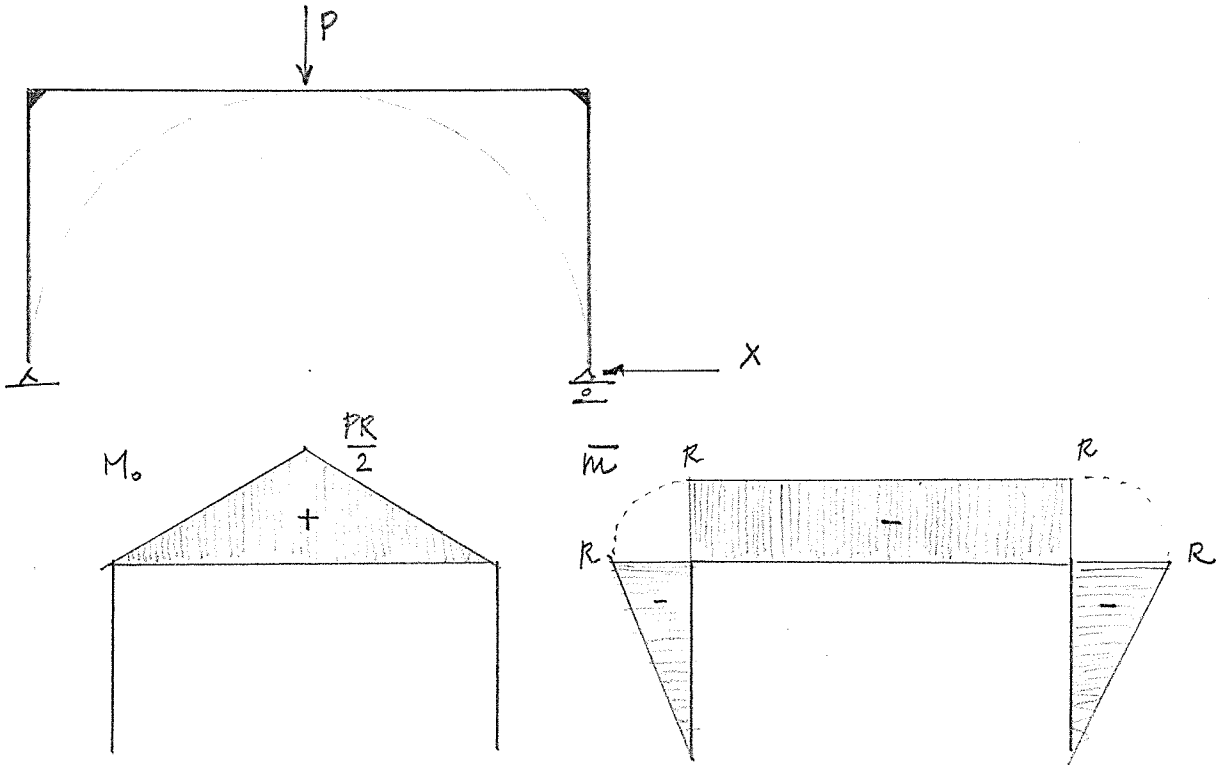
$$f = \int \frac{\bar{m} \bar{m} ds}{EI} = 2 \int_0^{\pi/2} \frac{R^2 \sin^2 \theta \, R \, d\theta}{EI} = \frac{2R^3}{EI} \int_0^{\pi/2} \sin^2 \theta \, d\theta$$

$$f = \frac{\pi R^3}{2EI}$$

$$X \cdot f + \delta_0 = 0 \Rightarrow X = \frac{PR^3}{\frac{\pi R^3}{2EI}} \cdot \frac{2EI}{\pi R^3} \Rightarrow \boxed{X = \frac{P}{\pi}}$$



Released Struct.



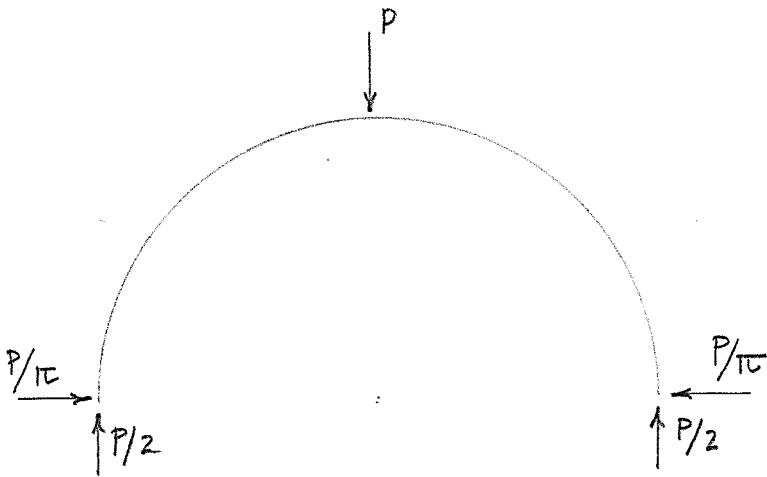
$$\delta_D = \int \frac{M_0 \bar{m} dx}{EI} = 2 \left[ \frac{1}{2} \cdot \frac{PR}{2} \cdot R \cdot R \right] \frac{1}{EI}$$

$$f = 2 \left[ \frac{1}{3} \cdot R \cdot R \cdot R + R \cdot R \cdot 2R \right] \frac{1}{EI}$$

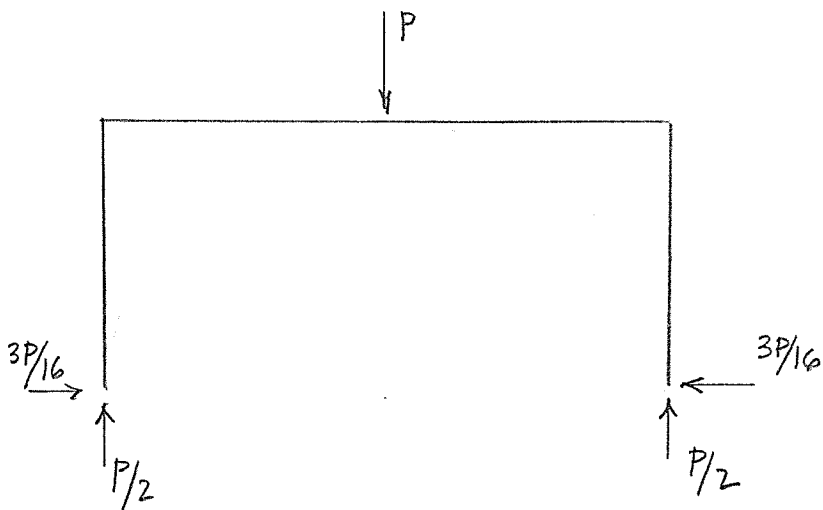
$$\delta_D = -\frac{PR^3}{2EI}$$

$$f = \frac{8R^3}{3EI}$$

$$X = \frac{PR^3}{2EI} \cdot \frac{3EI}{8R^3} \Rightarrow \boxed{X = \frac{3P}{16}}$$



$$\frac{P}{16} \approx 0.318 P //$$



$$\frac{3P}{16} \approx 0.188 P //$$