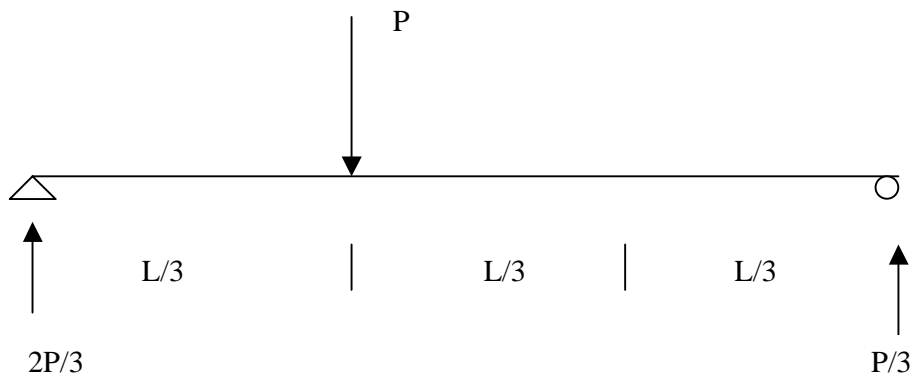


## Homework #1 CES 6106, Fall 2000

Given the following structure, find the deflection at the centerline



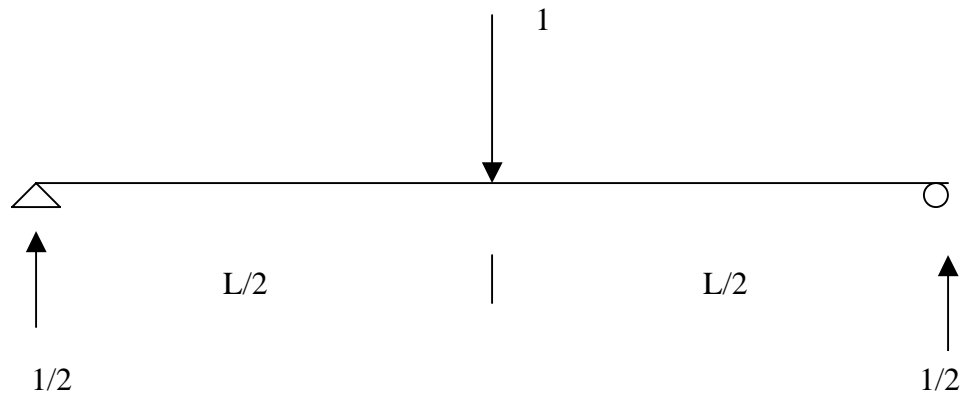
Real Structure Moment Equations

$$M_1 := \frac{2P}{3} \cdot x_1$$

$$M_2 := \frac{2P}{3} \left( \frac{L}{3} + x_2 \right) - P \cdot x_2$$

$$M_3 := \frac{-P}{3} x_3$$

Virtual Load on Structure



### Virtual Structure Moment Equations

$$Mv_1 := \frac{x_1}{2}$$

$$Mv_2 := \frac{\left(\frac{L}{3} + x_2\right)}{2}$$

$$Mv_3 := \frac{-x_3}{2}$$

The internal work intergral of MM/EI is:

$$\left( \int_0^{\frac{L}{3}} M_1 \cdot Mv_1 dx_1 + \int_0^{\frac{L}{6}} M_2 \cdot Mv_2 dx_2 + \int_0^{\frac{L}{2}} M_3 \cdot Mv_3 dx_3 \right) \rightarrow \frac{23}{1296} \cdot L^3 \cdot P$$