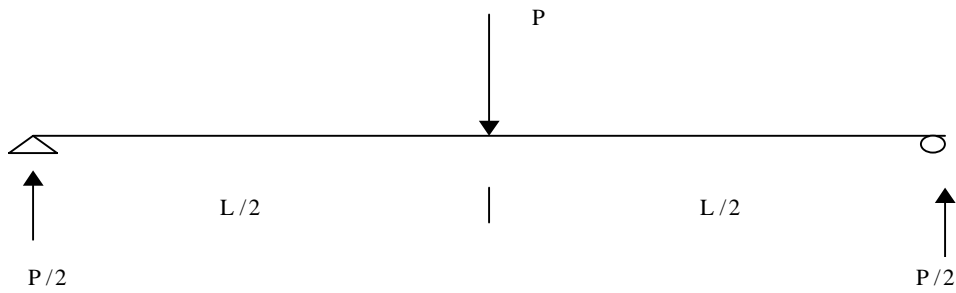


## Homework #1 CES 6106, Fall 2000

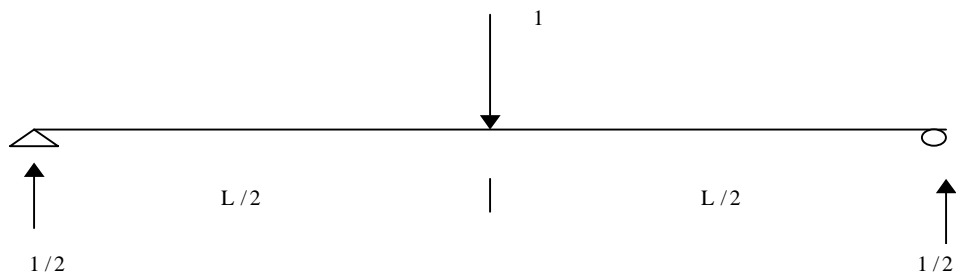
Given the following structure, find the deflection at the centerline



Real Structure Moment Equations (Left half only)

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

Virtual Load on Structure



Virtual Structure Moment Equations (Left Half Only)

$$M_{v1} := \frac{x_1}{2}$$

The internal work intergral of  $MM/EI$  is:

$$\left[ \frac{2}{EI} \left( \int_0^{\frac{L}{2}} M_1 \cdot M_{v1} dx_1 \right) \right] \rightarrow \frac{1}{(48 \cdot EI)} \cdot L^3 \cdot P$$

Note: 2 times is used since the structure is symmetric (the M equations are the same on the right half, using a coordinate system from right end to center).