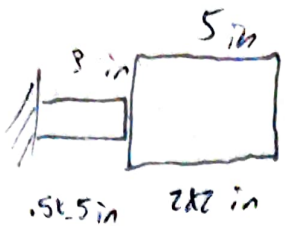


HW #13

ME 360

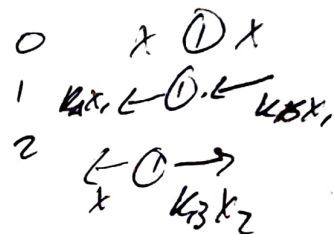
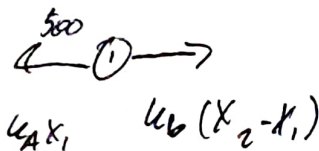
Will Brance



$$k_A = \frac{(10.4 \text{ MB/in})(1.5 \text{ in}^2)}{3 \text{ in}} = 1.733 \times 10^6 \text{ lb/in}$$

$$k_B = \frac{(10.4 \text{ MB/in})(4 \text{ in}^2)}{5 \text{ in}} = 8.32 \times 10^6 \text{ lb/in}$$

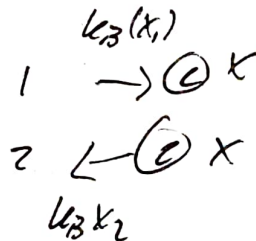
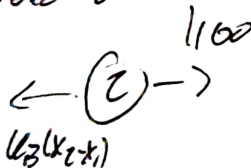
Note 1:



$$500 + k_A x_1 = k_B (x_2 - x_1)$$

$$\Rightarrow \boxed{500 = k_B (x_2 - x_1) - k_A x_1}$$

Note 2:



$$\boxed{k_B (x_2 - x_1) = 1100}$$

$$\begin{bmatrix} -(k_A + k_B) & -k_B \\ -k_B & k_B \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} 500 \\ 1100 \end{bmatrix} \Rightarrow \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \frac{1}{1.441856 \text{ E}13} \begin{bmatrix} 1005300 - 432000 \\ 832000 - 832000 \end{bmatrix}$$

$$\begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} 6.972 \text{ E} - 7 & -5.8004 \\ -5.8004 & 5.8004 \end{bmatrix} \begin{bmatrix} 500 \\ 1100 \end{bmatrix} \Rightarrow \begin{bmatrix} x_1 \\ x_2 \end{bmatrix} = \begin{bmatrix} -2.86137 \text{ E} - 4 \\ 3.462204 \text{ E} - 4 \end{bmatrix} \begin{bmatrix} 500 \\ 1100 \end{bmatrix}$$

$$\boxed{x_2 = 3.462204 \text{ E} - 4 \text{ in}}$$