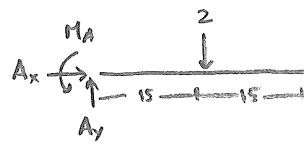
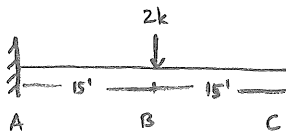


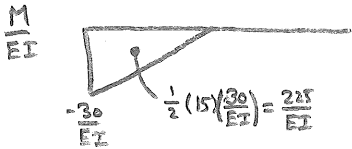
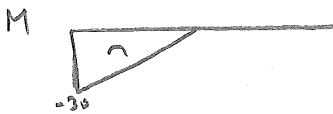
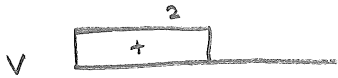
Homework 5: Problem 1



$$\rightarrow \sum F_x = 0 \Rightarrow A_x = 0$$

$$\uparrow \sum F_y = 0 \Rightarrow A_y = 2k$$

$$\odot \sum M_A = 0 \Rightarrow M_A = 30 k \cdot ft$$



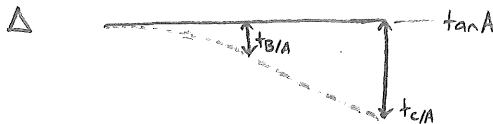
$$\theta_{B/A} = \theta_B - \theta_A \Rightarrow \theta_B = \theta_{B/A} + \theta_A^0 = -\frac{225}{EI} \Rightarrow \theta_B = -\frac{225}{EI}$$

$$\theta_{C/A} = \theta_C - \theta_A \Rightarrow \theta_C = \theta_{C/A} + \theta_A^0 = -\frac{225}{EI} \Rightarrow \theta_C = -\frac{225}{EI}$$

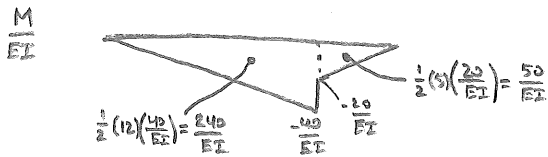
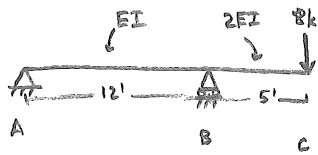
$$v_B = t_{B/A} = -\frac{225}{EI} \left(\frac{2}{3} \cdot 15 \right) = -\frac{2250}{EI} \Rightarrow v_B = -\frac{2250}{EI}$$

$$v_C = t_{C/A} = -\frac{225}{EI} \left(15 + \frac{2}{3} \cdot 15 \right) = -\frac{5625}{EI} \Rightarrow v_C = -\frac{5625}{EI}$$

$$I_{min} \Rightarrow \frac{-5625}{(29000) I} \times 12^3 = -3.5 \Rightarrow I = 95.76 \text{ in}^4$$



Homework 5: Problem 2



$$\Theta_A = \frac{t_{B/A}}{12} \quad t_{B/A} = -\frac{240}{EI} \left(\frac{1}{3} \cdot 12\right) = -\frac{960}{EI}$$

$$\Rightarrow \Theta_A = -\frac{80}{EI} = -\frac{80}{(29000)(1000)} \times 12^2 = \underline{\underline{3.97 \times 10^{-3} \text{ rad}}}$$

$$\Theta_{C/A} = \Theta_C + \Theta_A \Rightarrow \Theta_C = \Theta_{C/A} + \Theta_A$$

$$\Rightarrow \Theta_C = \left(-\frac{240}{EI} - \frac{50}{EI}\right) - \left(-\frac{80}{EI}\right) = -\frac{210}{EI} = -\frac{210}{(29000)(1000)} \times 12^2$$

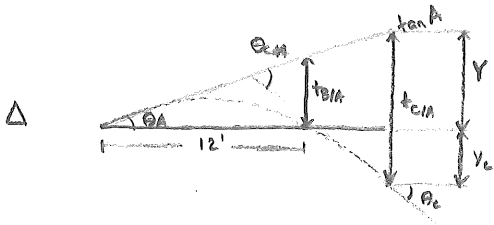
$$= \underline{\underline{-1.04 \times 10^{-2} \text{ rad}}}$$

$$y_C = t_{C/A} - Y \quad Y = \frac{17}{12} t_{B/A}$$

$$t_{C/A} = -\frac{50}{EI} \left(\frac{2}{3} \cdot 5\right) - \frac{240}{EI} \left(5 + \frac{1}{3} \cdot 12\right) = -\frac{2326.67}{EI}$$

$$\Rightarrow y_C = -\frac{2326.67}{EI} - \frac{17}{12} \left(-\frac{960}{EI}\right) = -\frac{966.67}{EI} = -\frac{966.67}{(29000)(1000)} \times 12^3$$

$$= \underline{\underline{-0.576 \text{ in.}}}$$



$$\Theta_A = 3.97 \times 10^{-3} \text{ rad}$$

$$\Theta_C = -1.04 \times 10^{-2} \text{ rad}$$

$$y_C = -0.576 \text{ in.}$$