

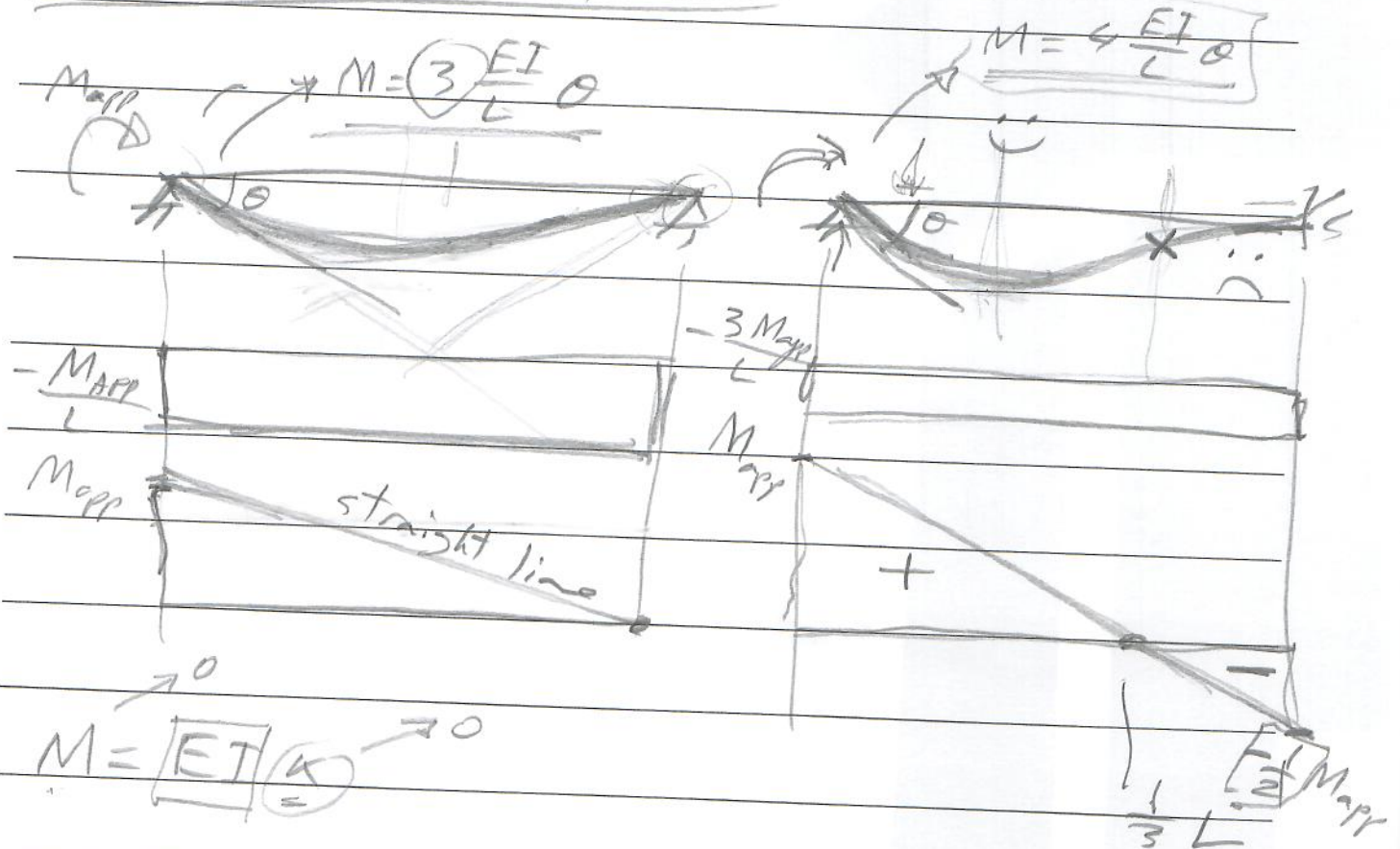
Lecture 2: Nov 1, 2022

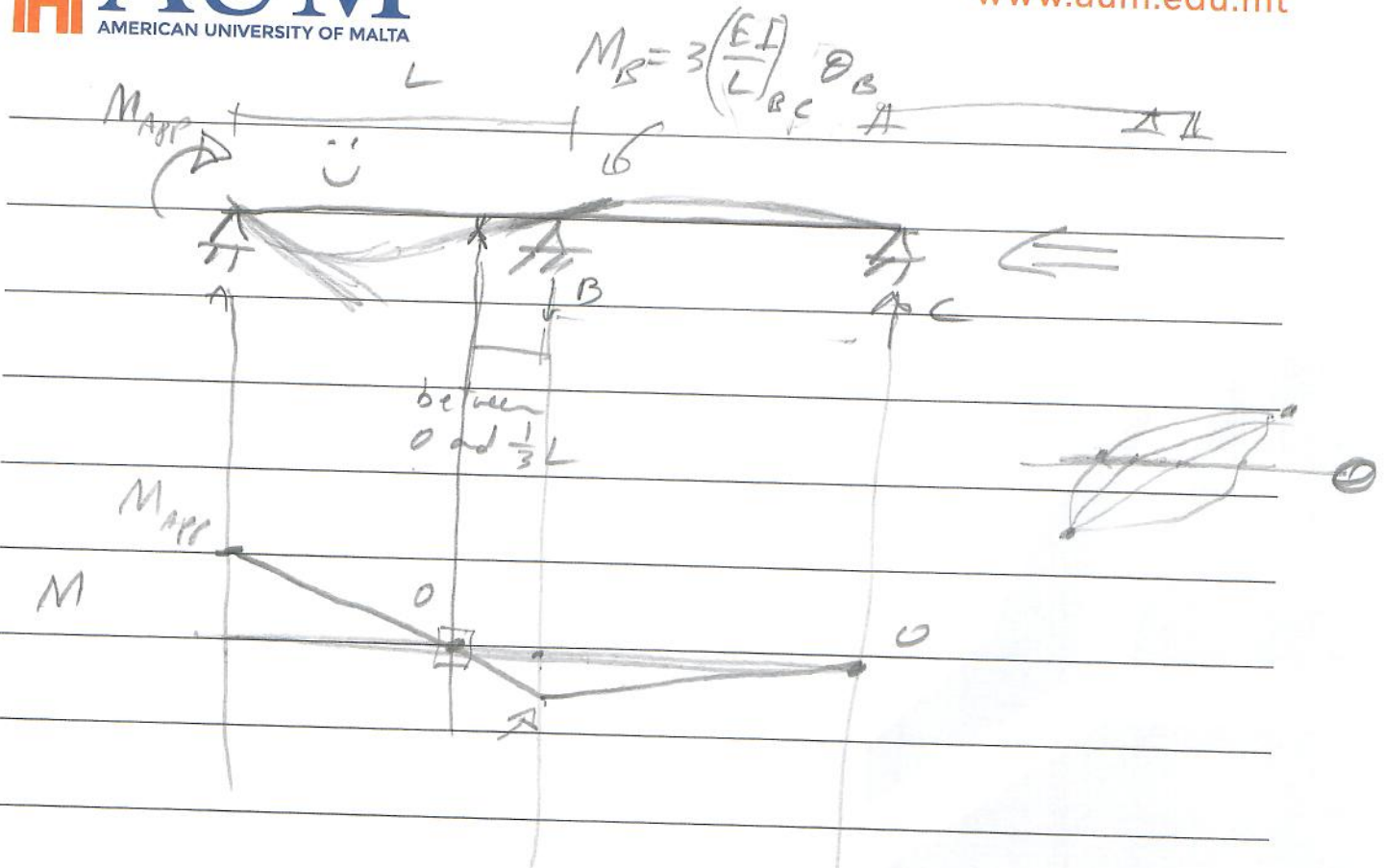
- ✓ Moment at end of beam and relevance
- ✓ Solve a few sample problems

- Discuss determinate versus indeterminate beams and frames

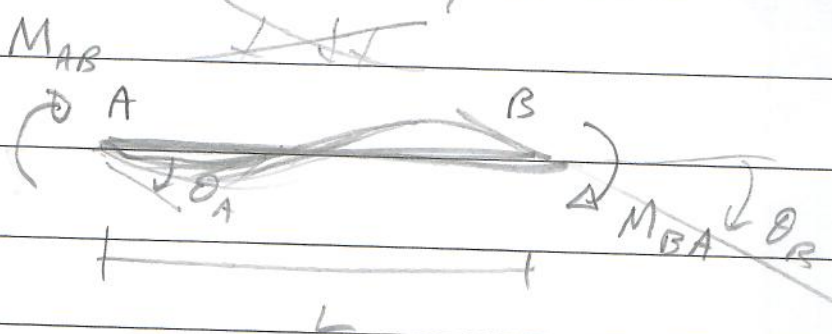


Moment at end of beam





Slope deflection equations

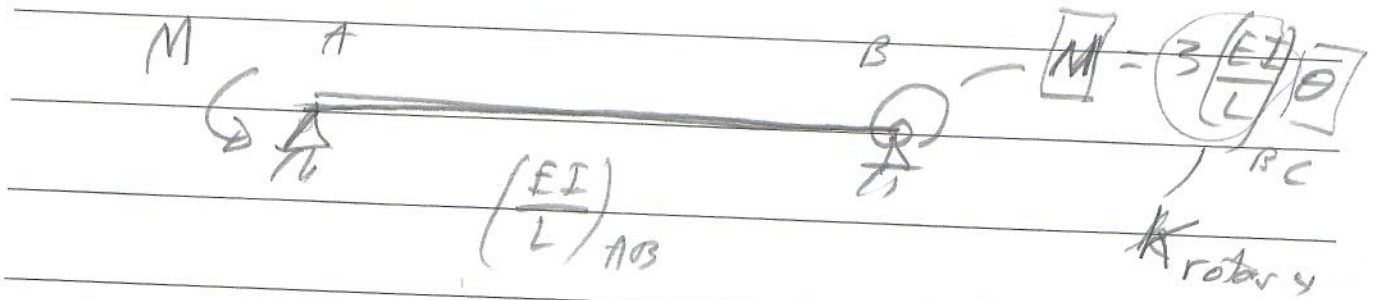


$$M_{AB} = 4 \frac{EI}{L} \theta_A + 2 \frac{EI}{L} \theta_B + \text{Not considered}$$

$$M_{BA} = 2 \frac{EI}{L} \theta_A + 4 \frac{EI}{L} \theta_B$$

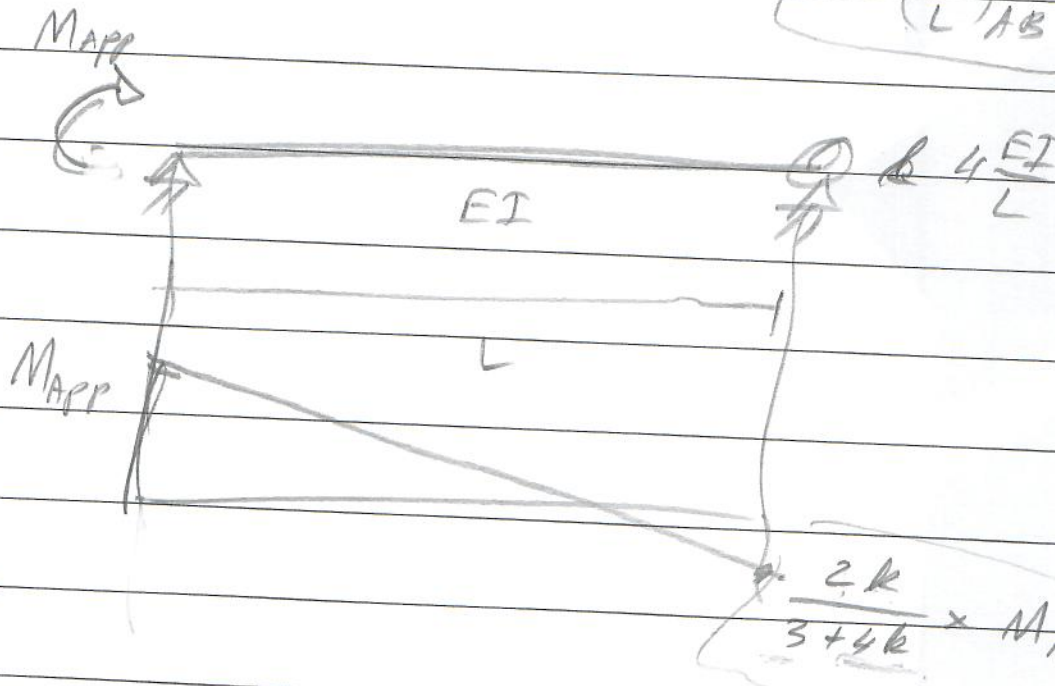
If $M_{BA} = 0 \Rightarrow \theta_A = -2\theta_B \Rightarrow \theta_B = -\frac{1}{2}\theta_A$

$$\Rightarrow M_{AB} = 3 \frac{EI}{L} \theta_A$$

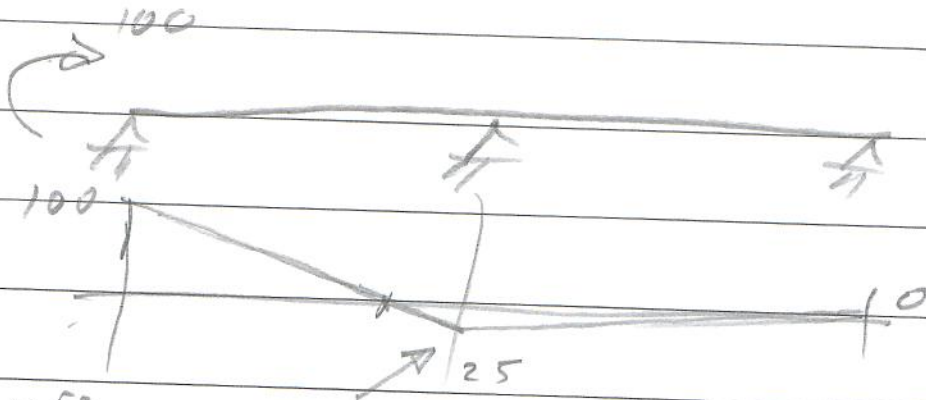


$$k \times (EI/L)_{AB}$$

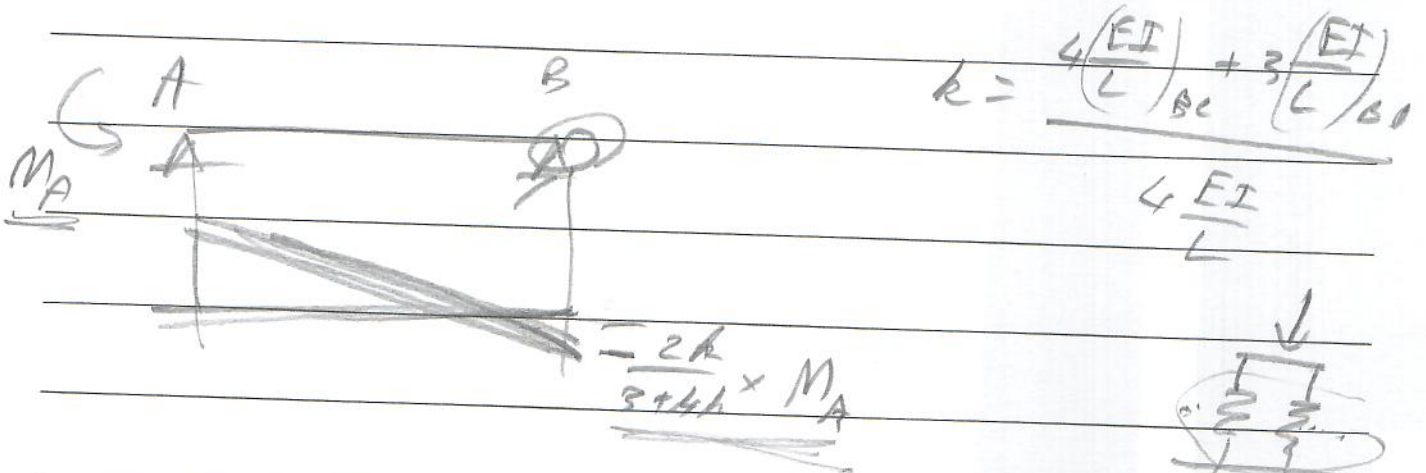
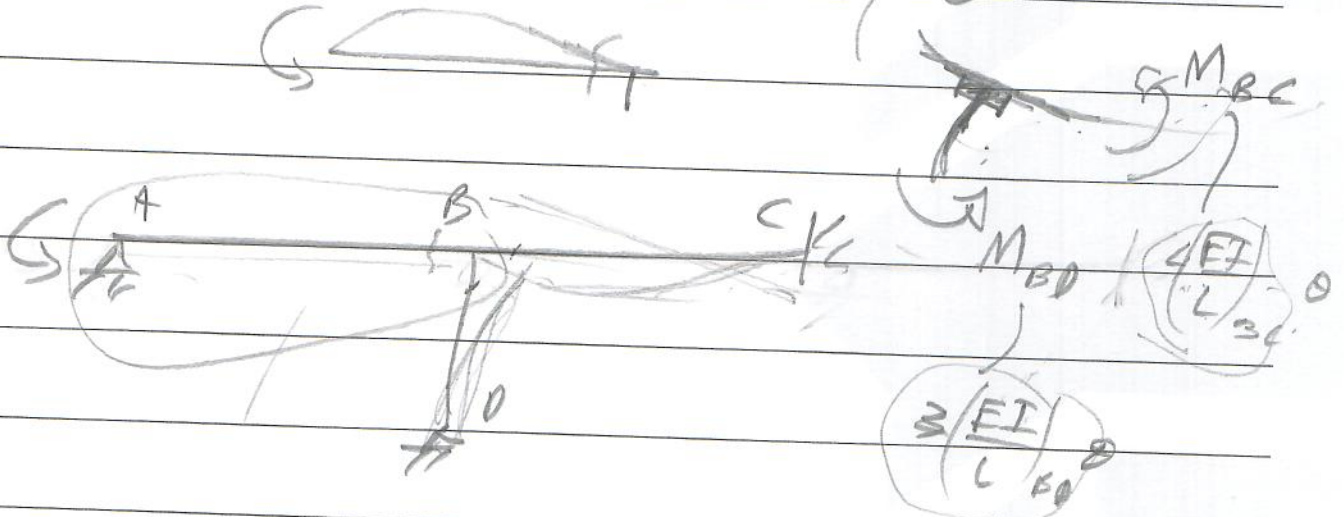
$$\frac{3(EI/L)_{BC}}{4(EI/L)_{AB}}$$



$\frac{2k}{3+4k} M_{App}$



$$k = \frac{3 \frac{EI}{L}}{4 \frac{EI}{L}} = \frac{3}{4} = 0.75$$



$$M_{BC} = \frac{4 \left(\frac{EI}{L} \right)_{BC}}{4 \left(\frac{EI}{L} \right)_B + 3 \left(\frac{EI}{L} \right)_{BD}} \times M_{BA}$$

