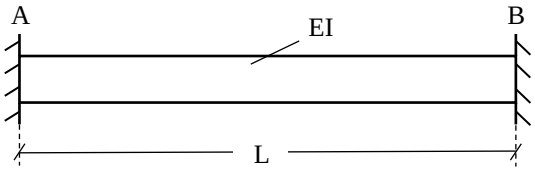
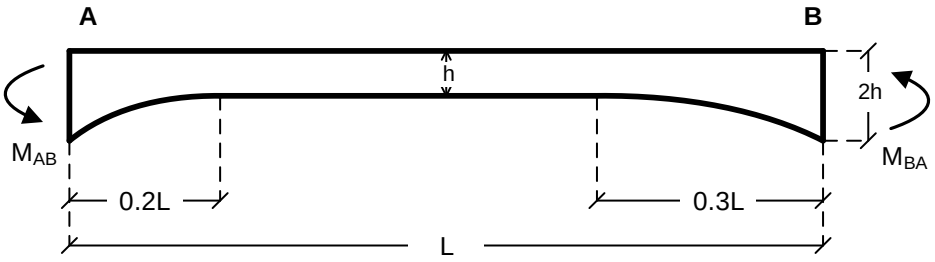
CE 425
Homework 1

Due Date: 13.10.2014

Q1) Calculate the flexibility coefficients of the given fixed-fixed beam. Take rotations at point A and B as your redundant forces. EI is constant through the length of the beam.



Q2) The slope deflections equations for a parabolic haunch beam are given below. Derive the element stiffness matrix for the given **beam** member (Do not consider axial deformations)?

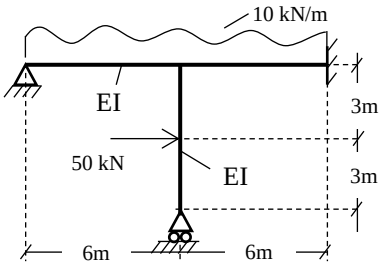


$$M_{AB} = \frac{6.73EI}{L}\left(\theta_A + 0.683\theta_B - 1.683\varphi\right) + FEM_{AB}$$

$$M_{BA} = \frac{7.68EI}{L}\left(0.598\theta_A + \theta_B - 1.598\varphi\right) + FEM_{BA}$$

Q3) Analyze the given structures using general stiffness method. Calculate the support reactions and draw moment diagram. Assume axial rigidity. EI is constant and same for all members.

a)



b)