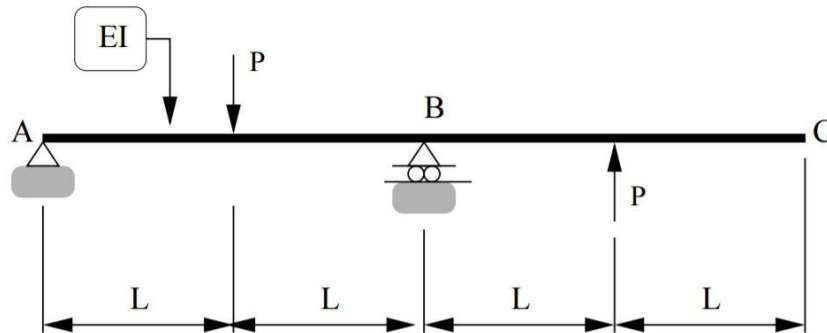


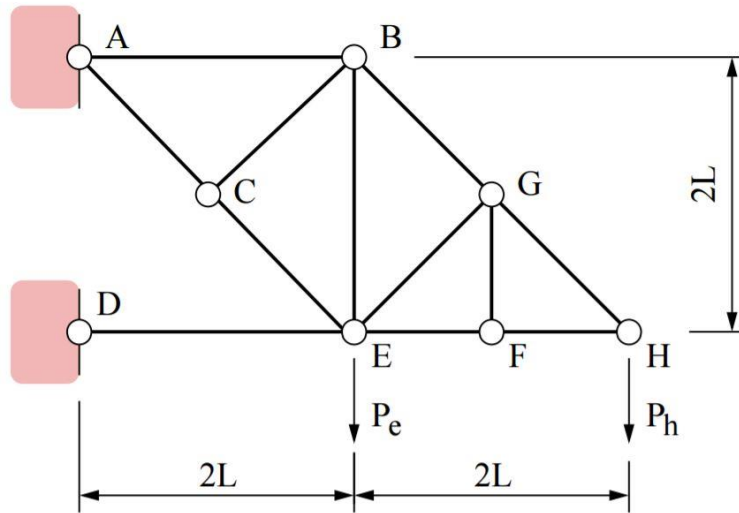
ENCE-353 Homework #6

1) Consider the cantilevered beam structure shown below



- 1a) Use the method of moment-area to compute the rotation at point A.
- 1b) Use the method of moment-area to compute the vertical deflection of the beam at point C.
- 1c) Draw the deflected shape of the beam. Indicate the sections of beam where the curvature is constant.

2) Consider the truss structure shown below



The horizontal and vertical degrees of freedom are fully-fixed at supports A and D. The truss carries vertical loads P_e and P_h at nodes E and H, respectively. All frame members have cross section properties AE .

2a) Use the method of joints to identify all of the zero-force members. Label these members on Figure.

2b) Use the principle of virtual forces to compute the vertical deflection at node E due to load P_e alone (i.e., $P_h = 0$).

2c) Use the principle of virtual forces to compute the vertical deflection at node H due to load P_h alone (i.e., $P_e = 0$).

2d) Use the principle of virtual forces to compute the two-by-two flexibility matrix connecting the vertical displacements at points E and H to applied loads P_e and P_h , i.e., as a function of P_e , P_h , L and AE .

$$\begin{bmatrix} \Delta_e \\ \Delta_h \end{bmatrix} = \begin{bmatrix} f_{11} & f_{12} \\ f_{21} & f_{22} \end{bmatrix} \begin{bmatrix} P_e \\ P_h \end{bmatrix}$$