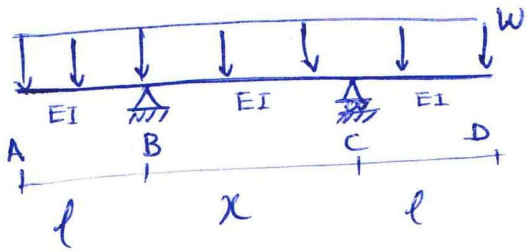
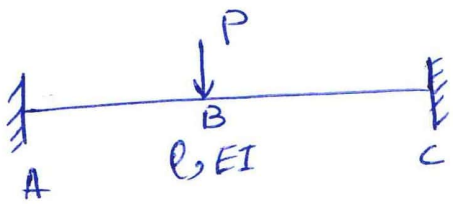
Homework 4 : From the book: 8-37, 8-38

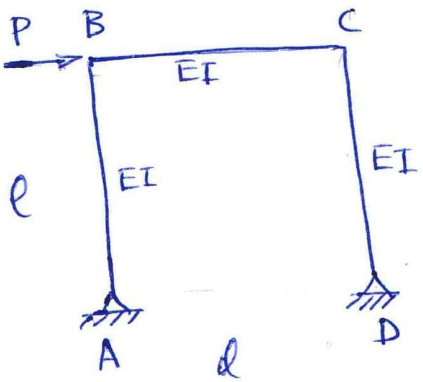
① Determine the length of BC span such that the vertical deflection of A and D points are zero ($\delta^v_A = \delta^v_D = 0$). ($x = ?$)



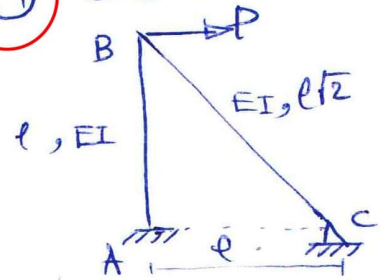
② Determine the support moments and forces and calculate the deflection under the load. (M_A, M_C and $\delta^v_B = ?$).



③ Calculate the support forces. (F^x_A, F^y_A, F^x_D and $F^y_D = ?$).

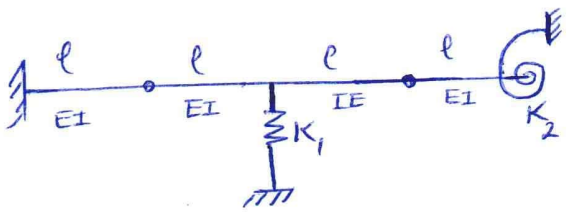


④ Calculate the support forces and rotation of joints. (F^x_A, F^y_B, M_A, F^x_C, F^y_C and $\theta_C = ?$).



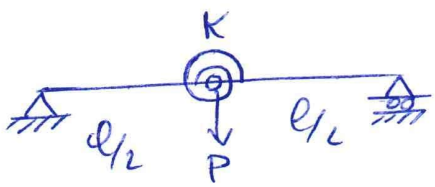
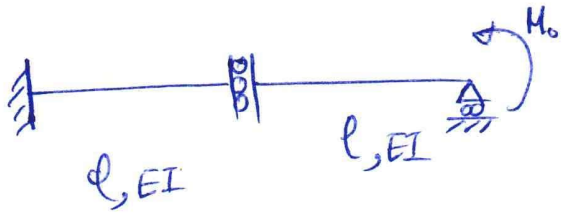
(5) Determine the conjugate beam in the following beams:

(a)



(b)

(6) Calculate θ_B^R and θ_B^L using conjugate beam method.



(7) Calculate δ_B^L using conjugate beame method.