CE383 STRUCTURAL ANALYSIS

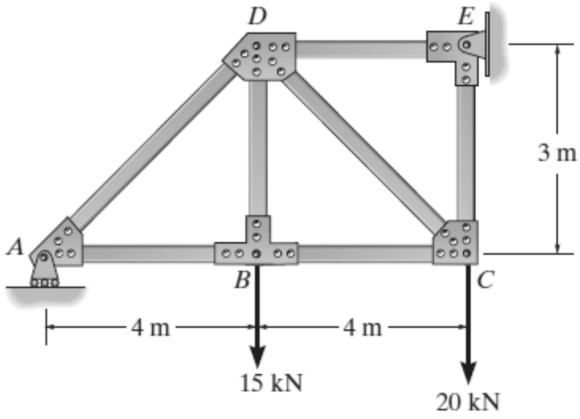
FALL 2014

HOMEWORK 2

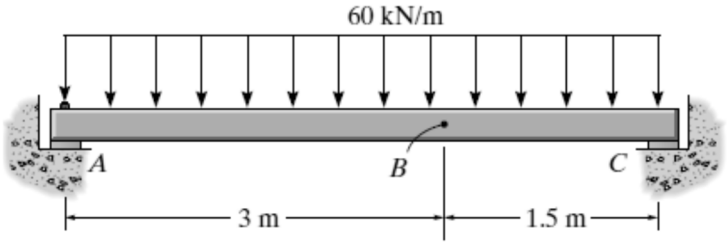
DUE: 03.11.2014 @ 13.00

Homework assignments submitted past the deadline will be accepted subject to a 20% deduction per day. Submit your homework assignments to the CE 383 box at the entrance of the K2 building.

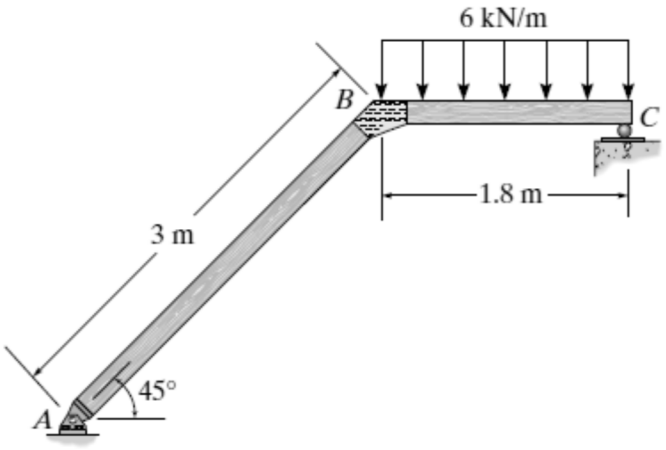
Q1) Calculate the vertical displacement of joint D of the truss structure shown by using the ***Unit Dummy Load Method***. Assume A = 500 mm^2 and E = 200 GPa for all members.



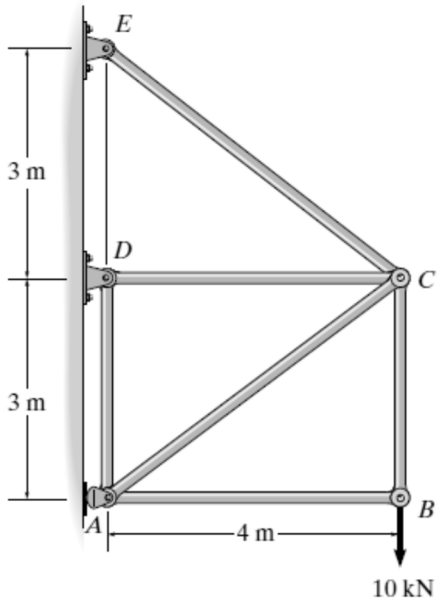
Q2) Determine the slope and displacement at point B of the simple beam shown by using the ***Unit Dummy Load Method***. Assume the support at A is a pin and C is a roller. Take E = 200 GPa, I = 120(10^6) mm^4.



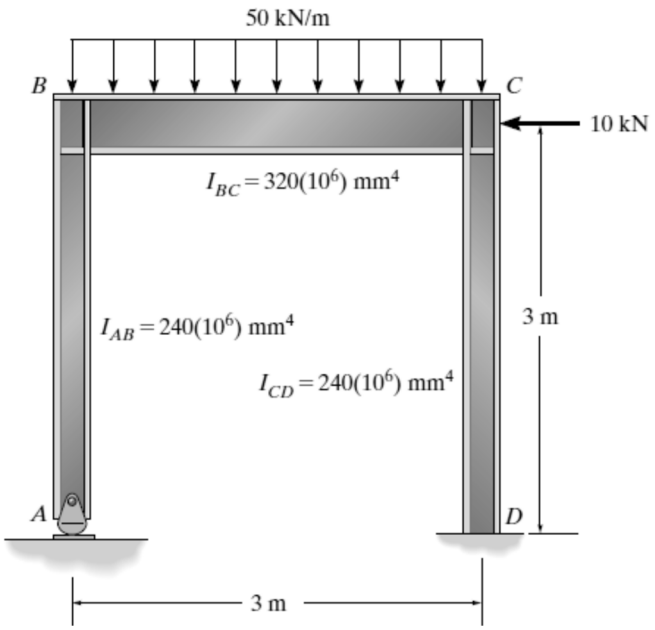
Q3) Determine the horizontal deflection at C by using the ***Unit Dummy Load Method***. Assume E = 200 GPa and I = 2×10^8 mm^4. There is a pin at A, and assume C is a roller and B is a rigid joint.



Q4) Solve the indeterminate truss system shown by using the ***Force Method***. Assume AE is constant. (Hint: member AC can be taken as redundant)



Q5) For the frame shown, determine the reactions at the supports by using the ***Force Method*** and draw the bending moment diagram. The moment of inertia of each segment of the frame is listed in the figure. Take E = 200 GPa.



Q6) The cantilevered beam is supported at one end by a 12.5-mm-diameter suspender rod AC and fixed at the other end B. Determine the force in the rod due to a uniform loading of 60 kN/m by using the ***Force Method***. Assume E = 200 GPa for both the beam and rod.