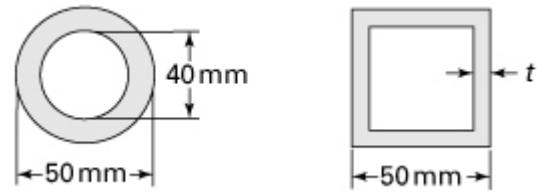
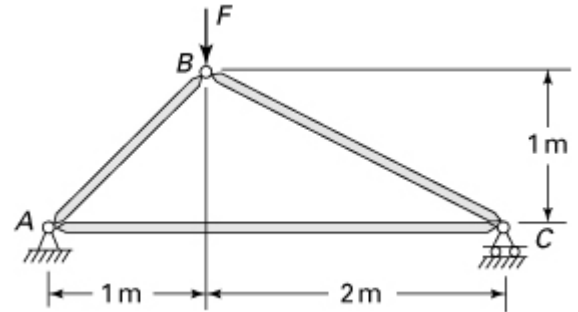


Homework 13

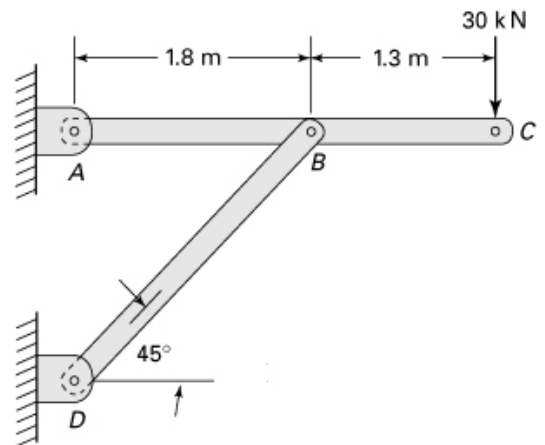
- 1) The figure shows the cross sections of two aluminum alloy 2114-T6 bars that are used as compression members, each with effective length of L_e . Find (a) the wall thickness of the hollow square bar so that the bars have the same cross-sectional area and (b) the critical load of each bar. Given: $L_e = 3$ m and $E = 72$ GPa (from Table D.1).



- 2) Based on a factor of safety of $n = 1.8$, determine the maximum load F that can be applied to the truss shown. Given: Each column is of 50 mm-diameter aluminum bar having $E = 70$ GPa.



- 3) Brace BD of the structure shown is made of a steel rod ($E = 210$ GPa and $\sigma_{yp} = 250$ MPa) with a square cross section (50 mm on a side). Calculate the factor of safety n against failure by buckling.



- 4) A horizontal rigid bar AB is supported by a pin-ended column CD and carries a load F . The column is made of steel bar having 50 by 50 mm square cross section, 3 m length, and $E = 200$ GPa. What is the allowable value of F based a factor of safety of $n = 2.2$ with respect to buckling of the column?

