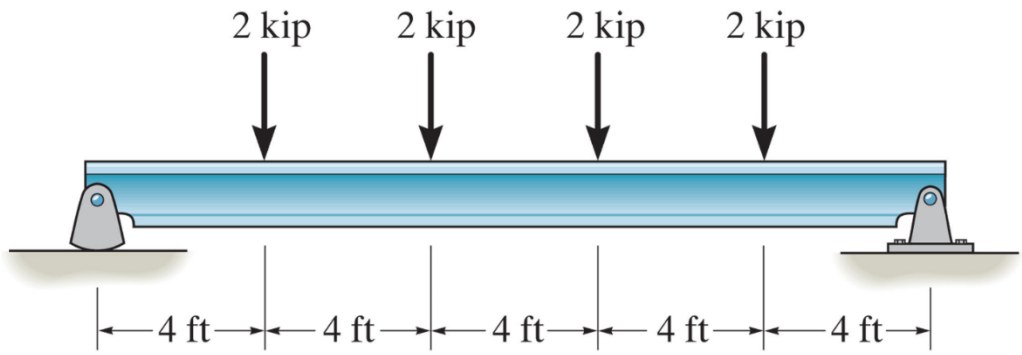
Chapter 6 Lecture Problems

Problem 6-4 (Equation Method)

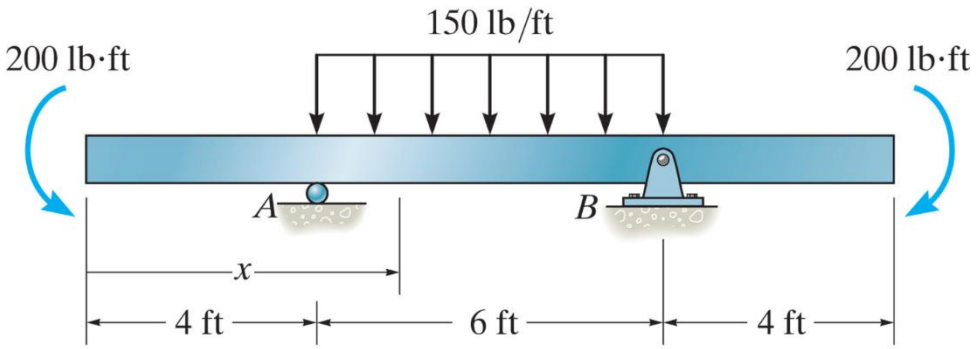
Draw the shear and moment diagrams for the beam.



Chapter 6 Lecture Problems

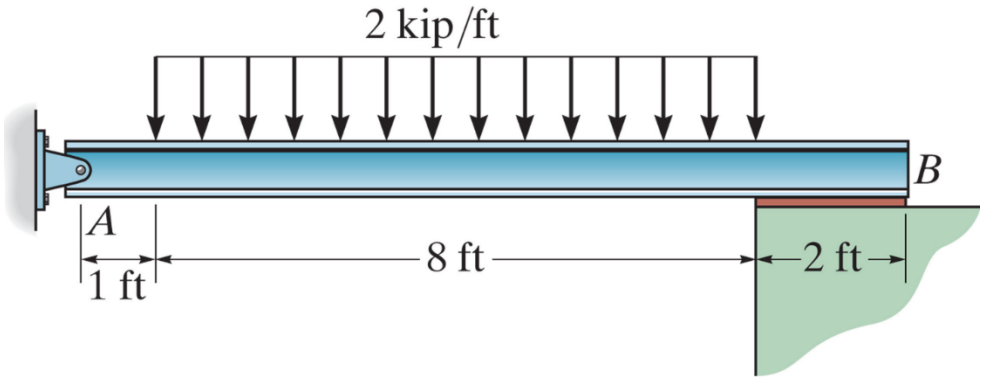
Problem 6-25 (Equation Method)

Draw the shear and moment diagrams for the beam and determine the shear and moment in the beam as functions of x, where 4 ft < x < 10 ft.



Problem 6-30 (Equation Method)

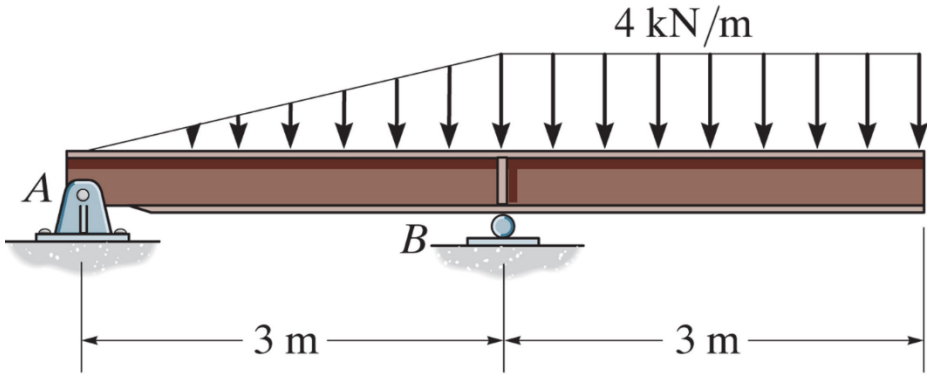
The beam is bolted or pinned at A and rests on a bearing pad at B that exerts a uniform distributed loading on the beam over its 2 ft length. Draw the shear and moment diagrams for the beam if it supports a uniform loading of 2 kip/ft.



Chapter 6 Lecture Problems

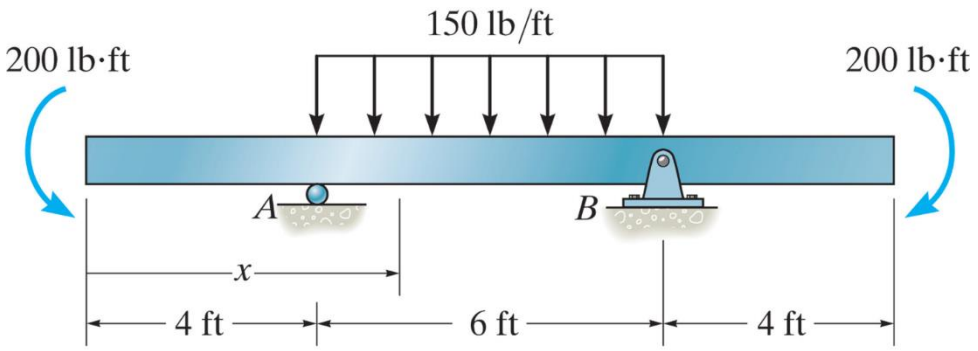
Problem 6-22 (Equation Method)

Draw the shear and moment diagrams for the overhang beam.



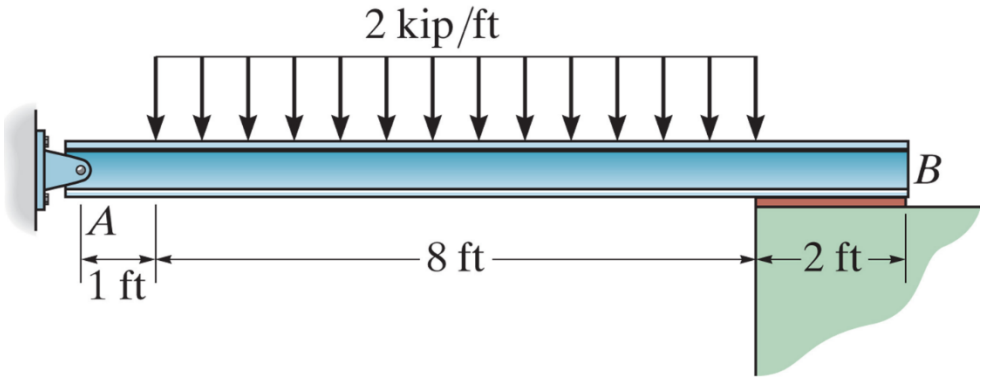
Problem 6-25 (Graphical Method)

Draw the shear and moment diagrams for the beam and determine the shear and moment in the beam as functions of x, where 4 ft < x < 10 ft.



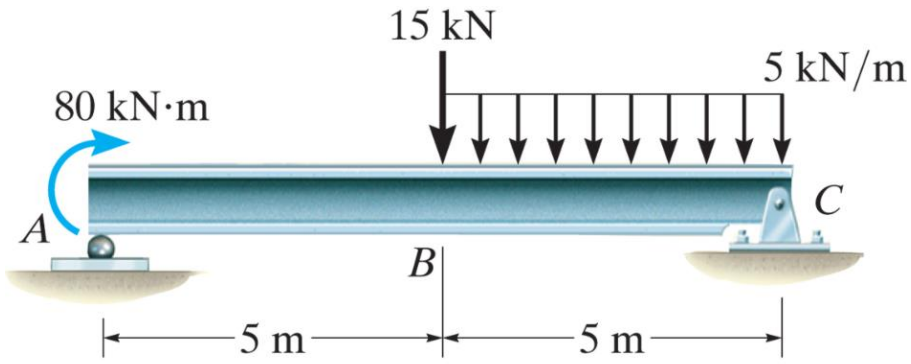
Problem 6-30 (Graphical Method)

The beam is bolted or pinned at A and rests on a bearing pad at B that exerts a uniform distributed loading on the beam over its 2 ft length. Draw the shear and moment diagrams for the beam if it supports a uniform loading of 2 kip/ft.



Example 6.4 (Graphical Method)

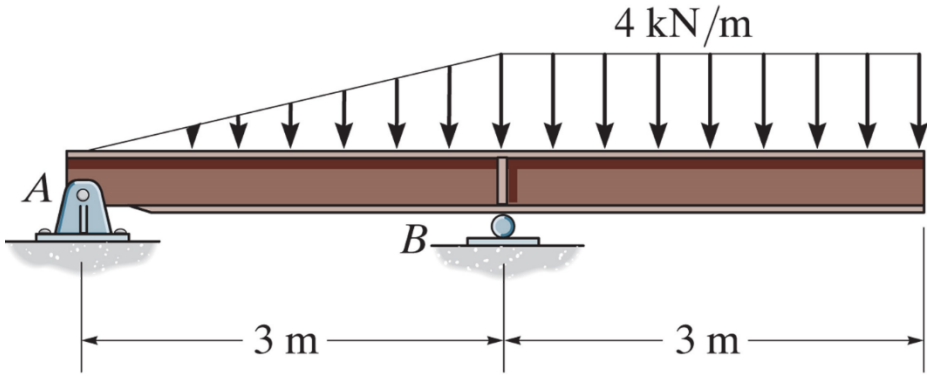
Draw the shear and moment diagrams for the beam shown.



Chapter 6 Lecture Problems

Problem 6-22 (Graphical Method)

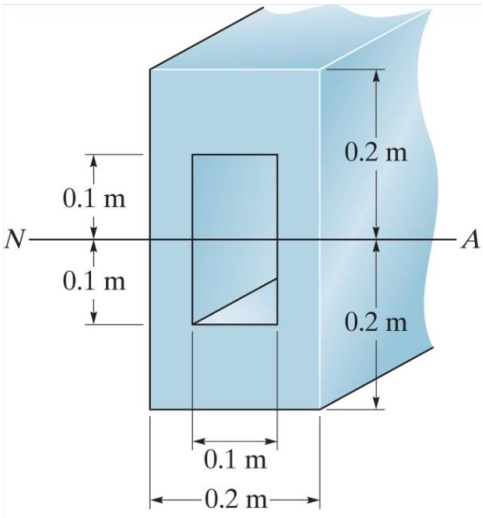
Draw the shear and moment diagrams for the overhang beam.

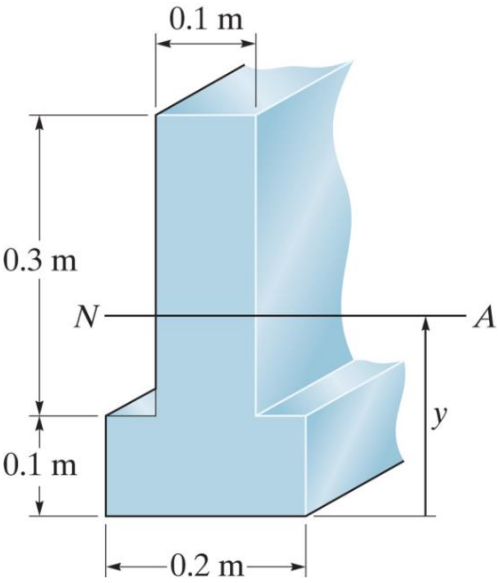


Chapter 6 Lecture Problems

Determining Centroids and Moments of Inertia

Determine the centroid and moment of inertia of the following cross-sections about the designated neutral axis.

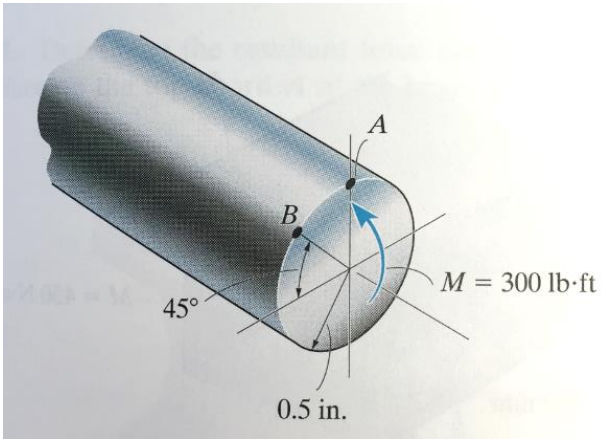




Chapter 6 Lecture Problems

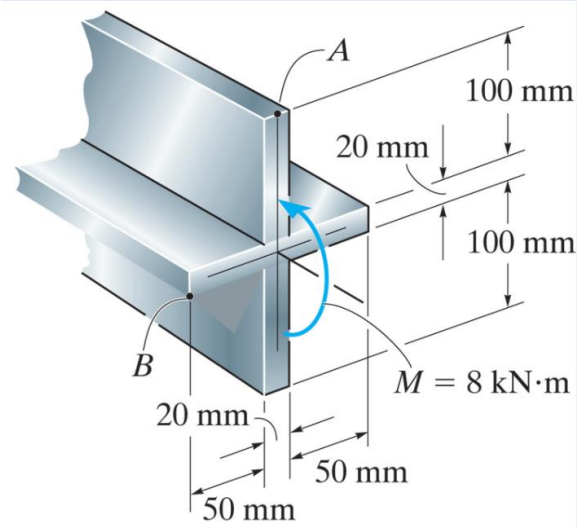
Example 1

The steel rod having a diameter of 1 in is subjected to an internal moment of M=300 lb-ft. Determine the stress created at points A and B. Also, sketch a 3-D view of the stress distribution acting over the cross section.



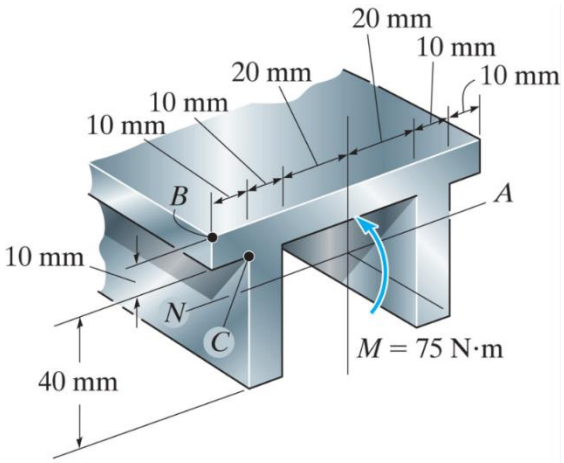
Problem 6-56

The aluminum strut has a cross-sectional area in the form of a cross. If it is subjected to the moment M = 8 kNm, determine the bending stress acting at points A and B, and show the results acting on volume elements located at these points.



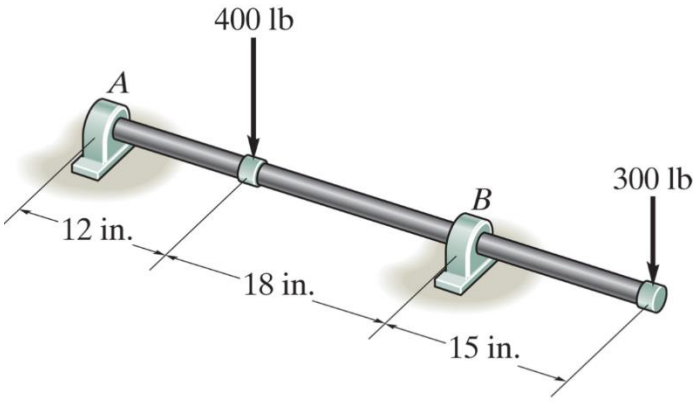
Problem 6-59

The aluminum machine part is subjected to a moment of M = 75 Nm. Determine the maximum tensile and compressive bending stresses in the part.



Problem 6-73

Determine the smallest allowable diameter of the shaft which is subjected to the concentrated forces. The sleeve bearings at A and B support only vertical forces, and the allowable bending stress is σ_{allow}=22 ksi.



Problem 6-94

The beam has a rectangular cross section as shown. Determine the largest load P that can be supported on its overhanging ends so that the bending stress does not exceed σ_{max}=10 MPa.