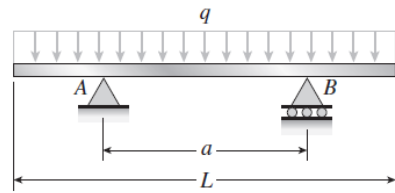


Homework #7

Problem 4.5-25 A beam of length L is being designed to support a uniform load of intensity q (see figure). If the supports of the beam are placed at the ends, creating a simple beam, the maximum bending moment in the beam is $qL^2/8$. However, if the supports of the beam are moved symmetrically toward the middle of the beam (as pictured), the maximum bending moment is reduced.

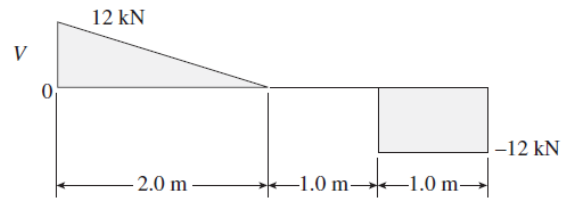
Determine the distance a between the supports so that the maximum bending moment in the beam has the smallest possible numerical value.

Draw the shear-force and bending-moment diagrams for this condition.



Problem 4.5-28 The shear-force diagram for a simple beam is shown in the figure.

Determine the loading on the beam and draw the bending-moment diagram, assuming that no couples act as loads on the beam.



Problem 4.5-27 The compound beam $ABCDE$ shown in the figure consists of two beams (AD and DE) joined by a hinged connection at D . The hinge can transmit a shear force but not a bending moment. A force P acts upward at A and a uniform load of intensity q acts downward on beam DE .

Draw the shear-force and bending-moment diagrams for this compound beam.

