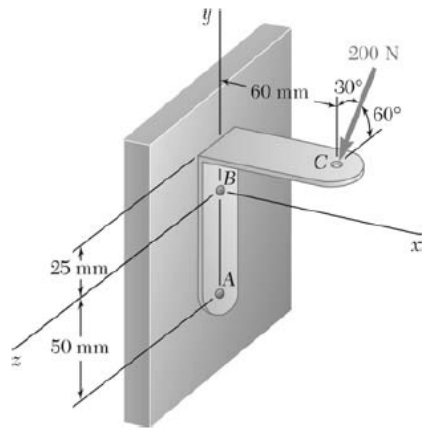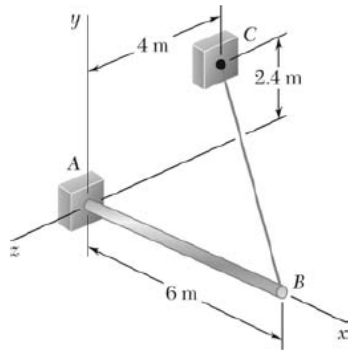## PROBLEM 3.8

It is known that a vertical force of 200 lb is required to remove the nail at C from the board. As the nail first starts moving, determine (*a*) the moment about B of the force exerted on the nail, (*b*) the magnitude of the force **P** that creates the same moment about B if $a = 10°$, (*c*) the smallest force **P** that creates the same moment about B.
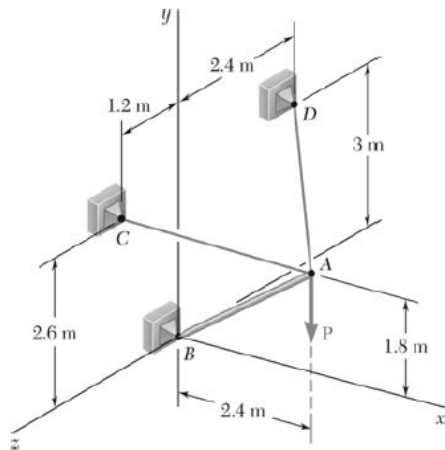
PROBLEM 3.21

A 200-N force is applied as shown to the bracket *ABC*. Determine the moment of the force about *A*.

PROBLEM 3.23

The 6-m boom AB has a fixed end A. A steel cable is stretched from the free end B of the boom to a Point C located on the vertical wall. If the tension in the cable is 2.5 kN, determine the moment about A of the force exerted by the cable at B.
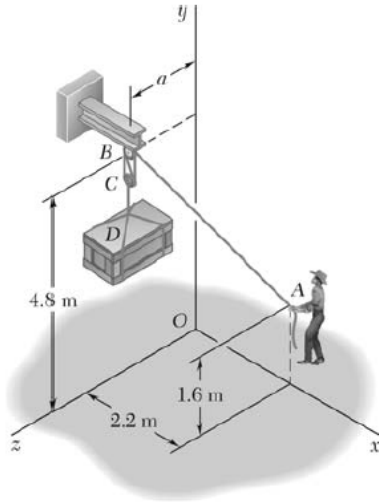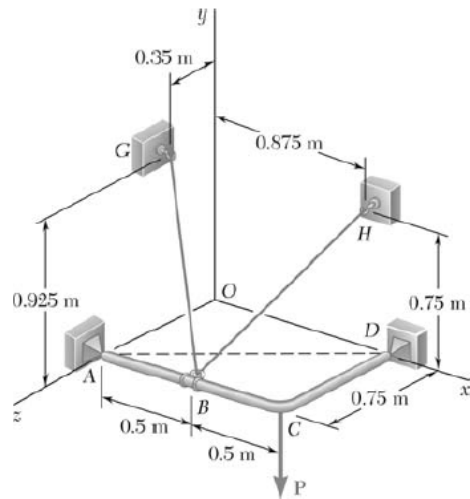
PROBLEM 3.41

Knowing that the tension in cable AC is 1260 N, determine (a) the angle between cable AC and the boom AB, (b) the projection on AB of the force exerted by cable AC at Point A.

PROBLEM 3.49

To lift a heavy crate, a man uses a block and tackle attached to the bottom of an I-beam at hook B. Knowing that the moments about the y and the z axes of the force exerted at B by portion AB of the rope are, respectively, 120 N · m and −460 N · m, determine the distance a.
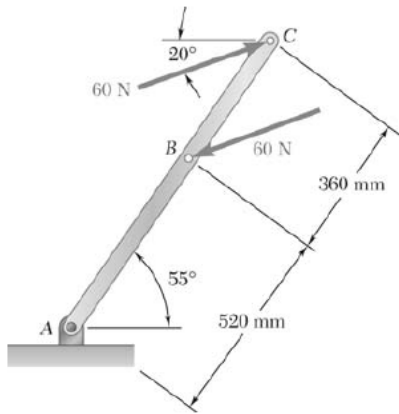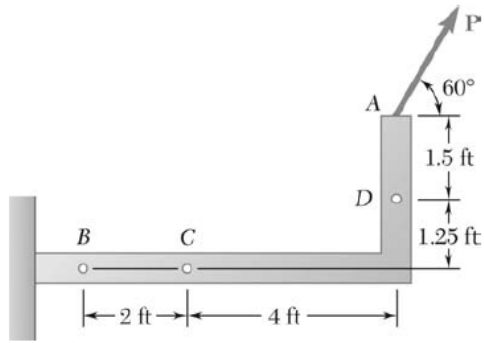
PROBLEM 3.64

In Problem 3.55, determine the perpendicular distance between portion BH of the cable and the diagonal AD.

PROBLEM 3.55 The frame ACD is hinged at A and D and is supported by a cable that passes through a ring at B and is attached to hooks at G and H. Knowing that the tension in the cable is 450 N, determine the moment about the diagonal AD of the force exerted on the frame by portion BH of the cable.
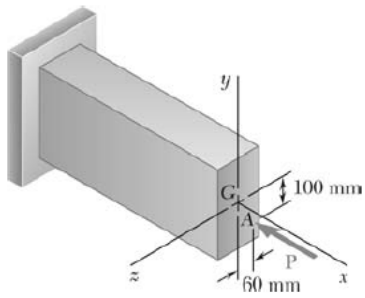
PROBLEM 3.70

Two parallel 60-N forces are applied to a lever as shown. Determine the moment of the couple formed by the two forces (*a*) by resolving each force into horizontal and vertical components and adding the moments of the two resulting couples, (*b*) by using the perpendicular distance between the two forces, (*c*) by summing the moments of the two forces about Point *A*.
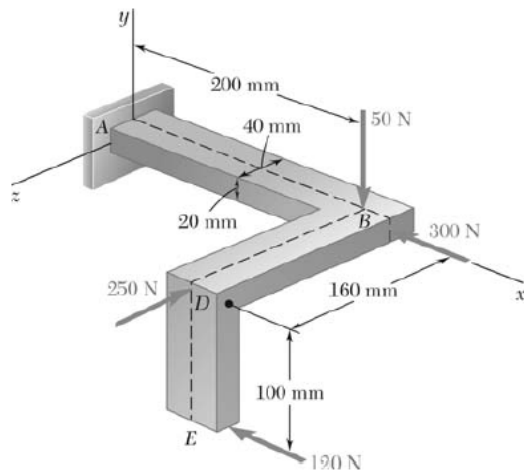
PROBLEM 3.82

A 160-lb force **P** is applied at Point A of a structural member. Replace **P** with (a) an equivalent force-couple system at C, (b) an equivalent system consisting of a vertical force at B and a second force at D.

PROBLEM 3.93

An eccentric, compressive 1220-N force **P** is applied to the end of a cantilever beam. Replace **P** with an equivalent force-couple system at *G*.

PROBLEM 3.119

Four forces are applied to the machine component *ABDE* as shown. Replace these forces by an equivalent force-couple system at *A*.