

Fig. 5-24 Diagram for Sample Problem 9.

Since the legs are symmetrically arranged and make equal angles with the vertical, we have, from $\Sigma F_y = 0$,

$$3F \cos \theta = 4.5$$

$$3F \left(\frac{3.45}{3.6} \right) = 4.5$$

$$F = \frac{3.6(4.5)}{3(3.45)} = 1.57\text{ kN} \quad \text{say, } F = 1.6\text{ kN (compression)}$$

PROBLEMS

- 5-1. Figure Problem 5-1 shows a tripod used in unloading heavy machinery. What is the force in each of the legs if the load is 4 tons?
- *5-2. Find the forces in all members in the bracket shown in Fig. Prob. 5-2. Members AD and CD are horizontal.
- 5-3. In the derrick shown in Fig. Prob. 5-3, what is the force in member BD when boom AC is in the position shown?
- 5-4. In the derrick shown in Fig. Prob. 5-3, what would be the force in BD if boom AC were rotated into plane ABD ?

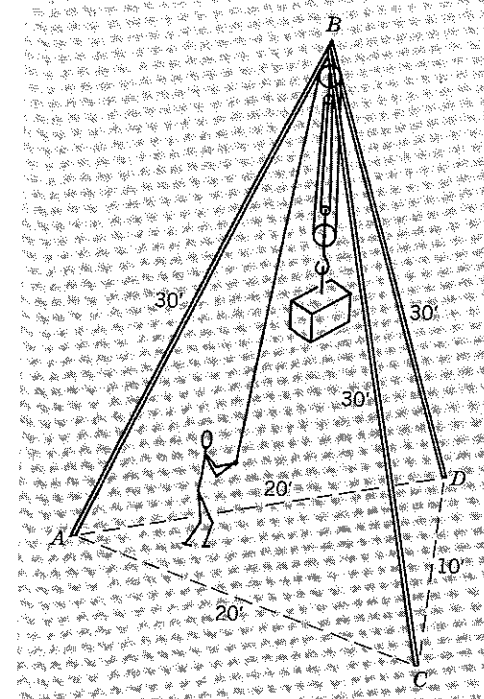


FIGURE PROBLEM 5-1

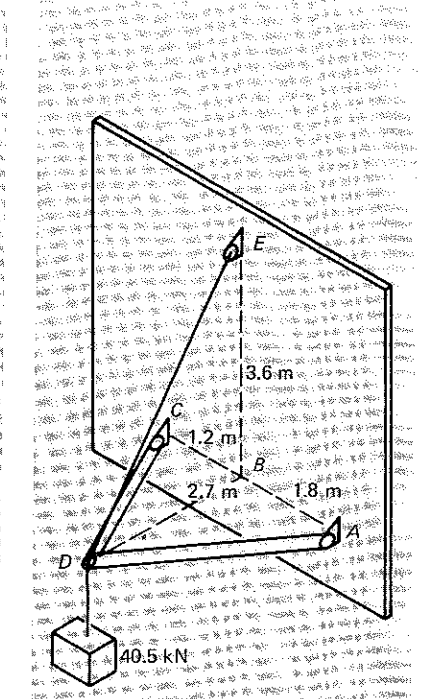


FIGURE PROBLEM 5-2

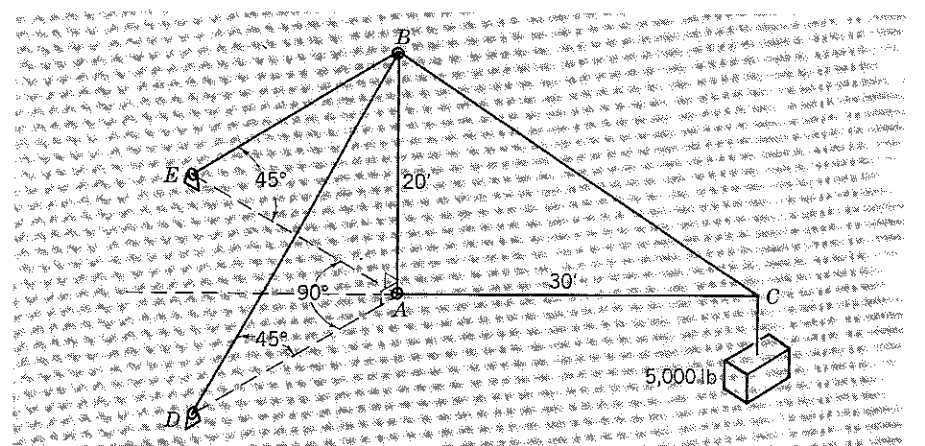


FIGURE PROBLEM 5-3

- 5-5. What are the forces in all parts of the shear leg crane shown in Fig. Prob. 5-5 if a naval gun weighing 50 tons is lifted?
- *5-6. Figure Problem 5-6 shows a derrick used in a quarry. The mast and boom are pivoted at the top and the bottom so they can be rotated through an angle α of 360° . The angle θ that the boom makes with the