

H.W. # 7

Due on Wednesday 4-10-1428 / 14-11-2007 (any time)

Deadline for submission: **Saturday 7-10-1428 / 17-11-2007 (before you sit in class)**

- 1- The derrick shown in Fig. P1 supports a 4000-lb load. It is held by a ball-and-socket at A and by two cables attached at points D and E . In the position shown, the derrick stands in a vertical plane forming an angle $\phi = 20^\circ$ with the xy plane. Determine the tension in each cable and the reactions at A . [Secs. 5.5 – 5.7] (25 pts.)
- 2- As shown in Fig. P2, a 2.5-m boom is held by a ball-and-socket at A and by two cables EBF and DC ; the cable EBF passes around a frictionless pulley at B . Determine the tension in each cable. [Secs. 5.5 – 5.7] (20 pts.)
- 3- A 20-kg door is made self-closing by hanging a 15-kg counterweight from a cable attached at C , as shown in Fig. P3. The door is held open by a force \mathbf{P} applied at the knob D , in a direction perpendicular to the door. Determine the magnitude of \mathbf{P} and the reactions at A and B when $\theta = 90^\circ$. It is assumed that the hinge at A does not exert any axial thrust. [Secs. 5.5 – 5.7] (20 pts.)
- 4- The 23-kg plate $ABCD$ shown in Fig. P4 measures 325 by 450 mm; it is held by hinges along edge AD and the wire BE . Determine the tension in the wire. [Secs. 5.5 – 5.7] (15 pts.)
- 5- Two rods are welded together to form a T-shaped lever which leans against a frictionless vertical wall at D and is supported by bearings at A and B , as shown in Fig. P5. A vertical force \mathbf{P} of magnitude 400 N is applied at the midpoint of rod DC . Determine the reaction at D . [Secs. 5.5 – 5.7] (20 pts.)

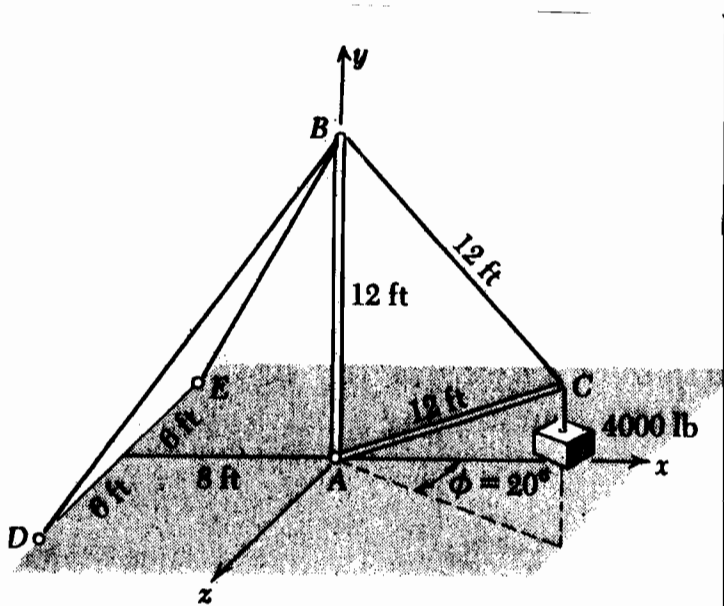


Fig. P1

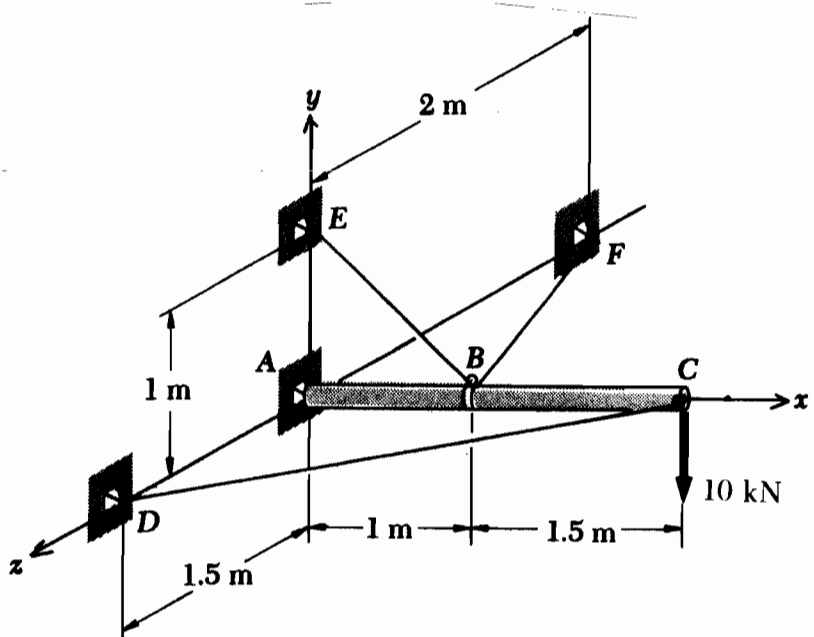


Fig. P2

Do your work yourself!! Remember that the homework carries 20% of the course grade; in addition, *solving it is the best way to understand the subject.* Of course, you can seek my help anytime in the homework as well as in anything else.

As an engineer, review the guidelines for submitting homework assignments given to you in class **BEFORE** you start solving and writing the homework. **DO NOT SUBMIT THE HOMEWORK IF YOU DO NOT FOLLOW ALL THESE GUIDELINES.** Cheating, copying, etc. is!!!!!!

Fig. P3

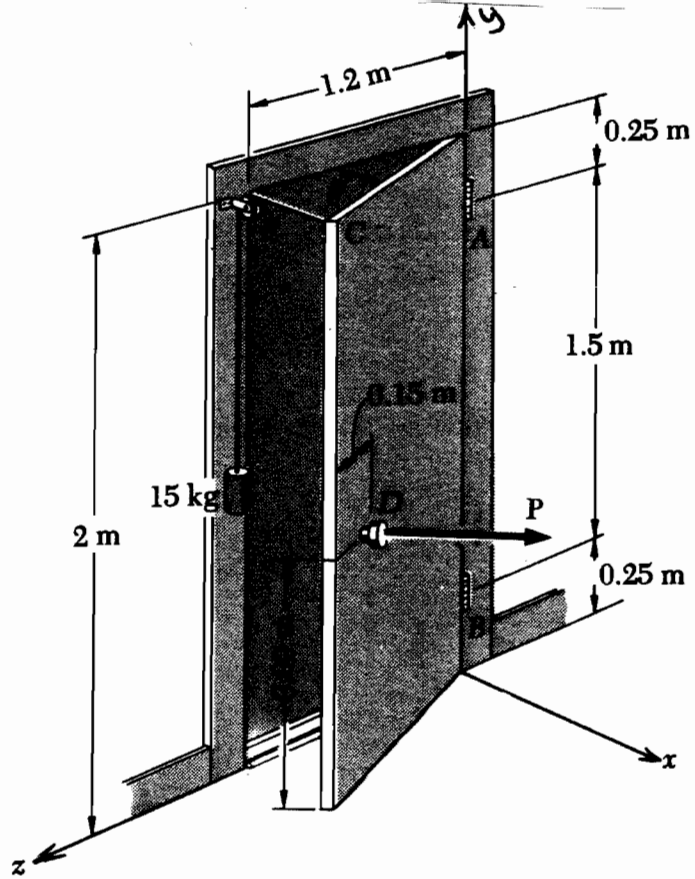


Fig. P4

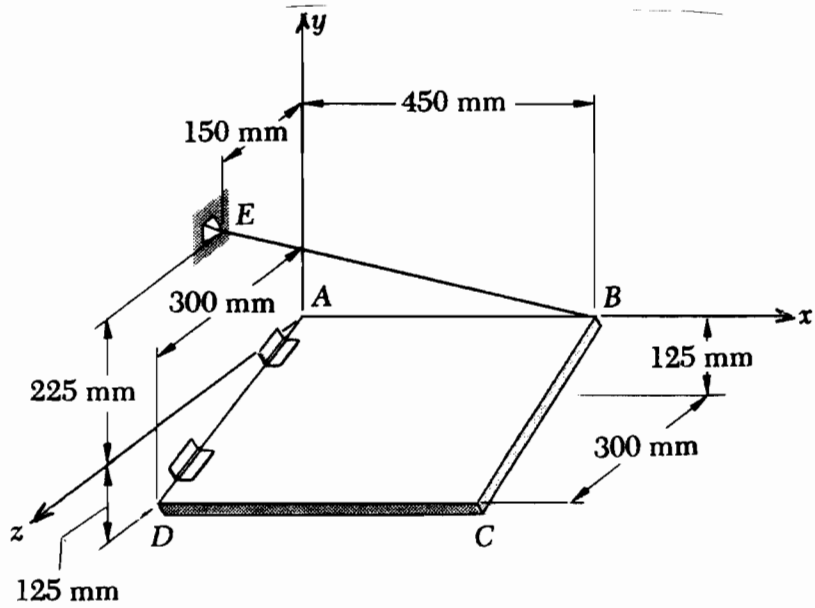


Fig. P5

