

King Fahd University of Petroleum & Minerals  
CIVIL ENGINEERING DEPARTMENT

CE 201 STATICS (Sections 3 & 4)

First Semester 1430-31 / 2009-10 (091)

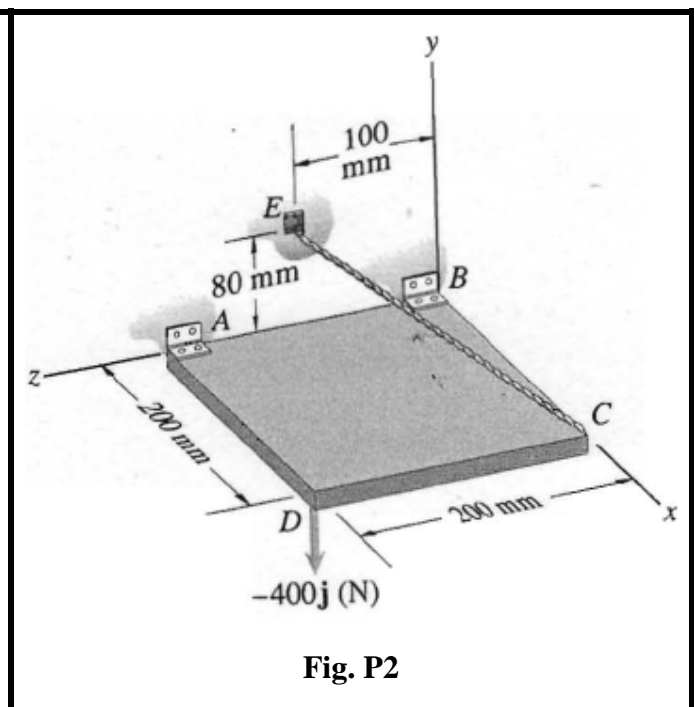
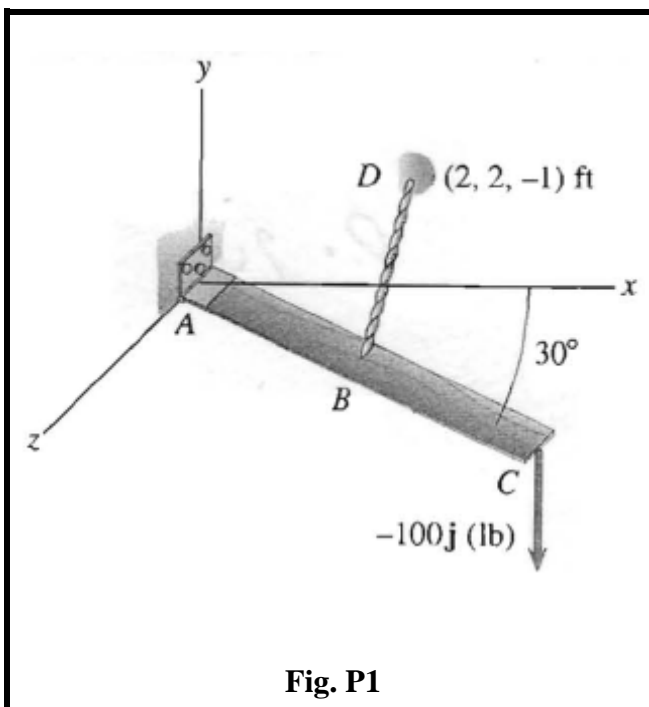
H.W. # 8

**Due** on Sunday 26-12-1430 / 13-12-2009 (any time)

**Deadline** for submission: **Monday 27-12-1430 / 14-12-2009 (before you sit in class)**

- 1- The bar  $AC$ , shown in Fig. P1, is 4 ft long and is supported by a hinge at  $A$  and the cable  $BD$ . The hinge axis is along the  $z$  axis. The centerline of the bar lies in the  $x$ - $y$  plane, and the cable attachment point  $B$  is the midpoint of the bar. Determine the tension in the cable and the reactions exerted on the bar by the hinge. *Check how many equations and how many unknowns, and comment.* [Secs. 5.5- 5.7] (20 pts.)
- 2- The plate, shown in Fig. P2, is supported by hinges at  $A$  and  $B$  and the cable  $CE$ . The *properly aligned* hinges do not exert couples on the plate, and the hinge at  $A$  does not exert a force on the plate in the direction of the hinge axis. Determine the reactions at the hinges and the tension in the cable. *Check how many equations and how many unknowns, and comment.* [Secs. 5.5- 5.7] (20 pts.)
- 3- The 8-ft bar, shown in Fig. P3, is supported by a ball and socket support at  $A$ , the cable  $BD$ , and a roller support at  $C$ . Point  $B$  is the midpoint of the bar. The force  $\mathbf{F} = -50\mathbf{k}$  (lb). Determine the tension in the cable  $BD$  and the reactions at  $A$  and  $C$ . *Check how many equations and how many unknowns, and comment.* [Secs. 5.5- 5.7] (20 pts.)
- 4- The *properly aligned* bearings at  $A$ ,  $B$ , and  $C$ , shown in Fig. P4, do not exert couples on the bar and do not exert forces in the direction of the axis of the bar. Determine the reactions at the bearings. *Check how many equations and how many unknowns, and comment.* [Secs. 5.5- 5.7] (20 pts.)
- 5- The 80-lb bar, shown in Fig. P5, is supported by a ball and socket support at  $A$ , the smooth wall it leans against, and the cable  $BC$ . The weight of the bar acts at its midpoint. Determine all reactions. *Check how many equations and how many unknowns, and comment.* [Secs. 5.5- 5.7] (20 pts.)

Note that solving five problems only in "equilibrium" (3-D or 2-D) is not enough to fully understand and master the subject!



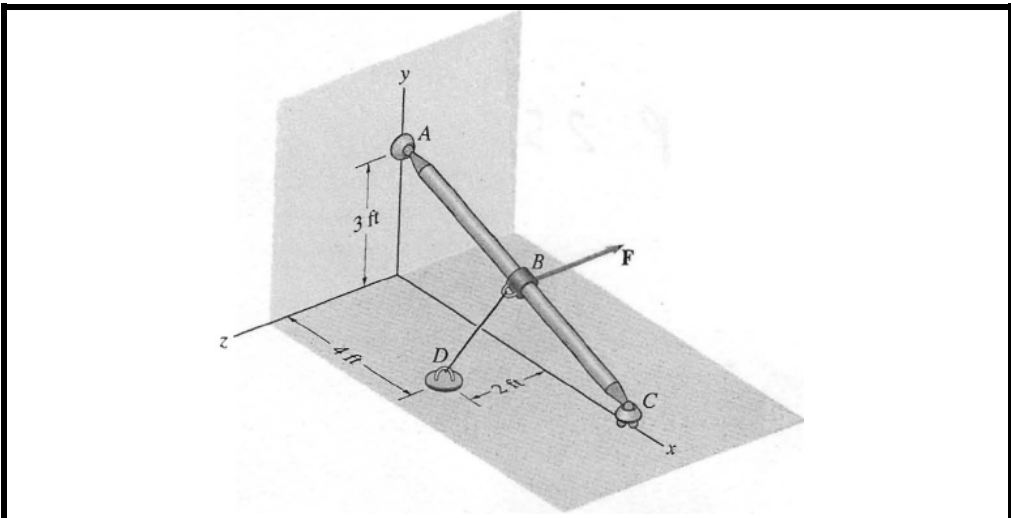


Fig. P3

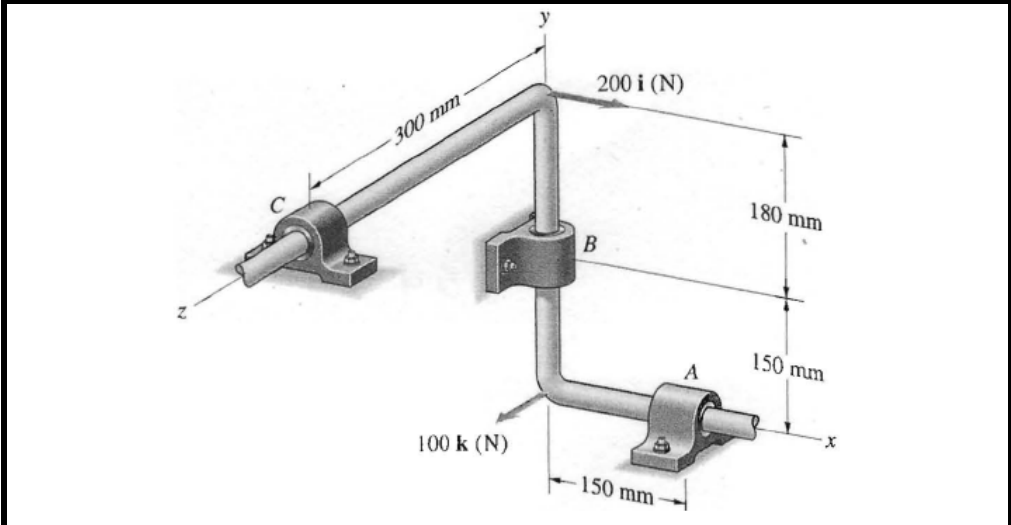


Fig. P4

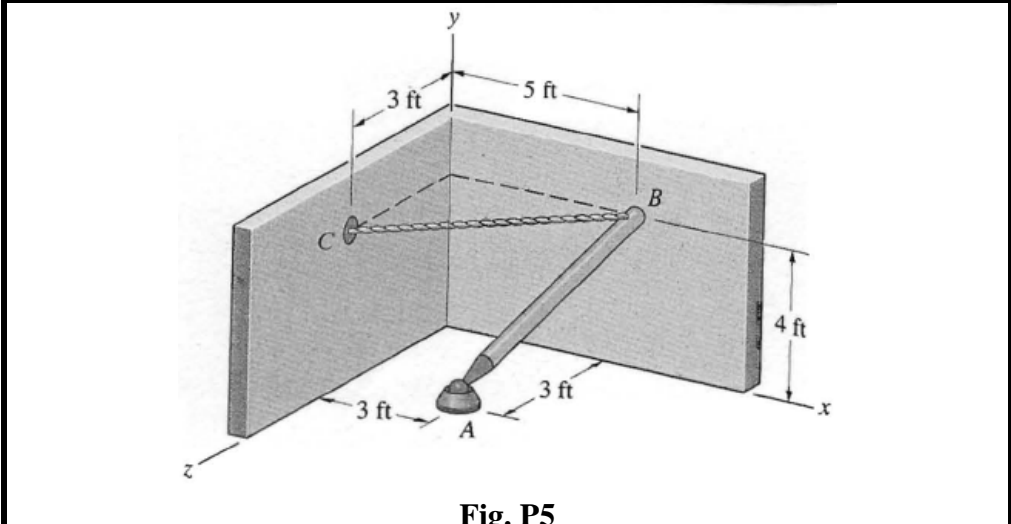


Fig. P5

Do your work yourself!! Remember that the homework carries more than 10% 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. FOLLOW ALL THESE GUIDELINES. Cheating, copying, etc. is .....!!!!!!