King Fahd University of Petroleum & Minerals
CIVIL ENGINEERING DEPARTMENT

CE 201 STATICS (Section **9**)
First Semester 1427-28 / 2006-07 (**061**)

H.W. # 4

Due on Sunday 15-9-1427 / 8-10-2006 **(any time)**

Deadline for submission: Monday 16-9-1427 / 9-10-2006 (**before you sit in class)**

1- As shown in Fig. P1, a container of weight W = 360 N is supported by cables AB and AC, which are tied to ring A. Knowing that **Q** = (60 N) **k**, determine
   (a) the magnitude of the force **P** which must be applied to the ring to maintain the container in the position shown,
   (b) the corresponding values of the tension in cables AB and AC. [Sec. 3.4] (20 pts.)

2- In trying to move across a slippery icy surface, a 78-kg man uses two ropes AB and AC, as shown in Fig. P2. In addition to that, a friend is helping the man at A by pulling on him with a force **P** = –(225 N)**k**. Knowing that the force exerted on the man by the icy surface is perpendicular to that surface, determine the tension in each rope. *(Assume the mass of the man is concentrated at A)* [Sec. 3.4] (25 pts.)

3- A 300-N force is applied at A as shown in Fig. P3. Determine
   (a) the moment of the 300-N force about D,
   (b) the smallest force applied at B which creates the same moment about D. [Sec. 4.1] (15 pts.)

4- The 6-m boom AB shown in Fig. P4 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 1900 N, determine
   (a) the moment about A of the force exerted by the cable at B,
   (b) the perpendicular distance from point A to cable CB. [Secs. 4-2 – 4.4] (20 pts.)

5- Consider the system shown in Fig. P5. Cables AB and AC have the same tension T. The tree will fail at O if the magnitude of the moment about O due to the forces exerted on it by the cables exceeds 5000 ft-lb. Based on this criterion, what is the maximum allowable value of T? [Secs. 4-2 – 4.4] (20 pts.)

Do <u>your</u> work *<u>yourself</u>*!! 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 <u>engineer</u>*, review the <u>guidelines for submitting homework assignments</u> given to you in class BEFORE you start solving and writing the homework. DO <u>NOT</u> SUBMIT THE HOMEWORK IF YOU DO NOT FOLLOW THESE GUIDELINES. *<u>Cheating, copying, etc. is ……..!!!!!!</u>

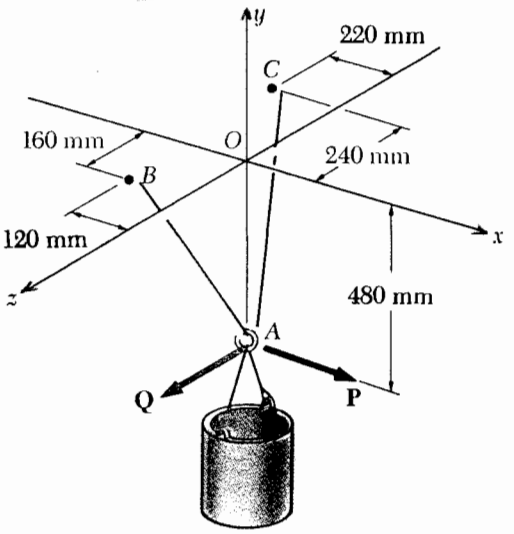

Fig. P1

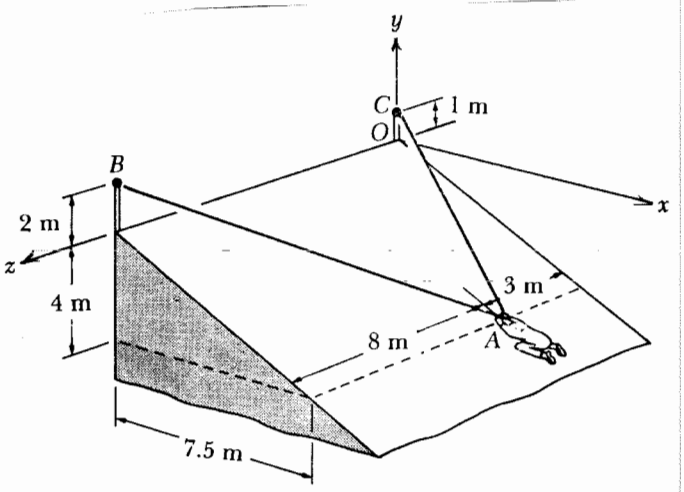

Fig. P2

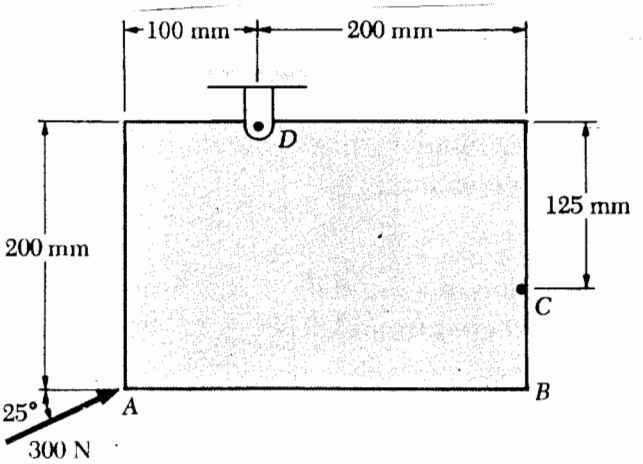

Fig. P3

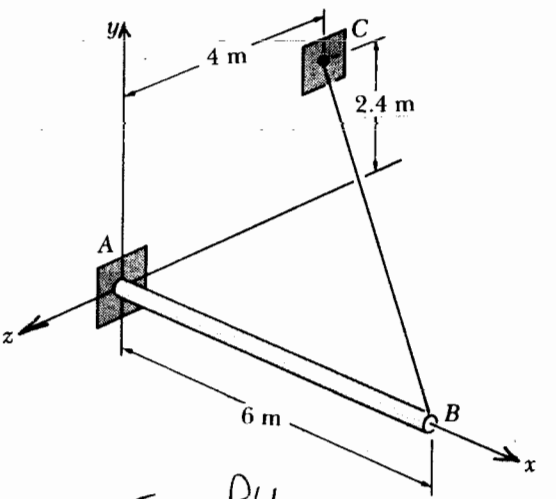

Fig. P4

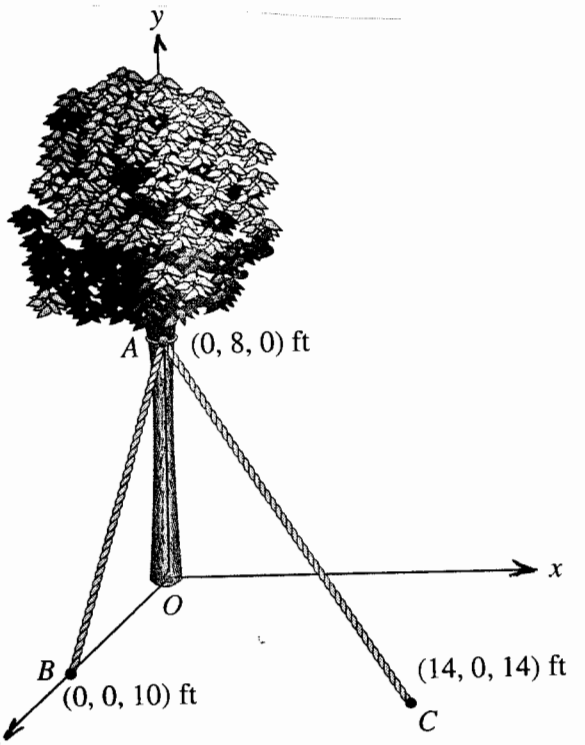

Fig. P5