

King Fahd University of Petroleum & Minerals
CIVIL ENGINEERING DEPARTMENT

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

H.W. # 7

Due on Sunday 21-10-1427 / 12-11-2006 (**any time**)

Deadline for submission: Monday 22-10-1427 / 13-11-2006 (**before you sit in class**)

- 1) Determine the reactions at B and C in Fig. P1 shown. [Secs. 5.1-5.4](15 pts.)
- 2) A truck-mounted crane is used to lift a 3-kN compressor as shown in Fig. P2. The weights of the boom AB and of the truck are as shown, and the angle of the boom forms with the horizontal is $\alpha = 40^\circ$. Determine the reaction at each of the two rear wheels C and the front wheels D. [Secs. 5.1-5.4] (20 pts.)
- 3) The mechanism shown in Fig. P3 is designed to measure the tension in a heavy paper tape used in a manufacturing process. Determine
 - (a) the force exerted at E by the spacing when the tension in the tape is 150 N,
 - (b) the corresponding reaction at D. [Secs. 5.1-5.4] (20 pts.)
- 4) A vertical load **P** is applied at end B of rod BC as shown in Fig. P4.
 - (a) Neglecting the weight of the rod, express the angle θ corresponding to the equilibrium position in terms of **P**, **l**, and the counterweight **W**.
 - (b) Determine the value of θ corresponding to equilibrium if $P = 2W$. [Secs. 5.1-5.4] (25 pts.)
- 5 A) A uniform pipe cover of radius $r = 240$ mm and mass 30 kg is held in a horizontal position by the cable CD as shown in Fig. P5A. Assuming that the bearings at A and B are properly aligned and the bearing at B does not exert any axial thrust, draw a **complete and clear free body diagram** for the cover. [Secs. 5.5-5.7] (10 pts.)
- 5 B) As shown in Fig. P5B, a 250-kg uniform rectangular platform, 3.20 m long and 2.25 m wide, is supported by hinges at A and B and by a cable attached to corners C and D of the platform and passing over a frictionless hook E. Assuming that the hinge at A does not exert any axial thrust, draw a **complete and clear free body diagram** for the platform. [Secs. 5.5-5.7] (10 pts.)

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 THESE GUIDELINES. Cheating, copying, etc. is!!!!!!

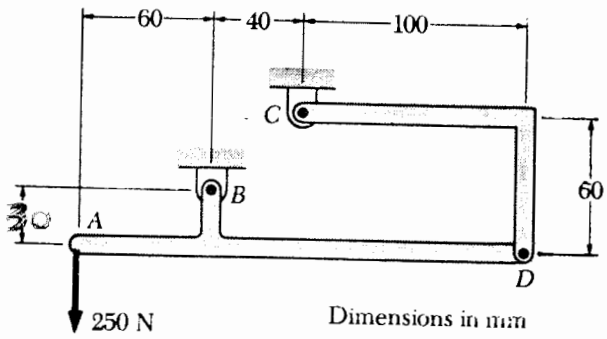


Fig. P1

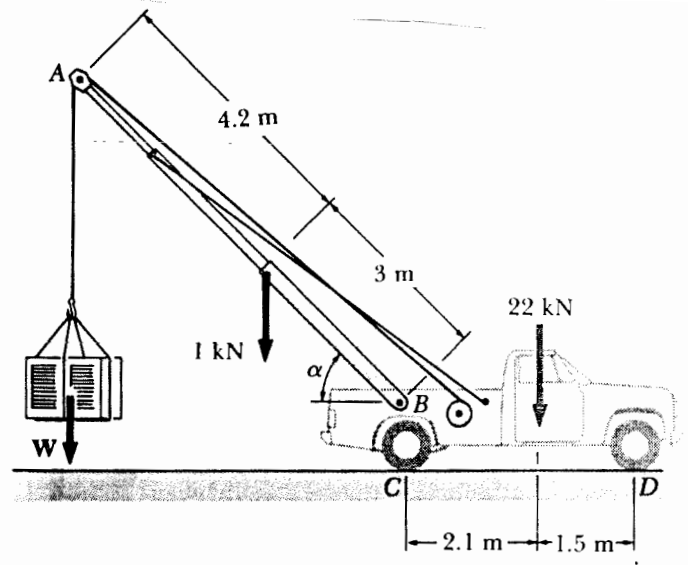


Fig. P2

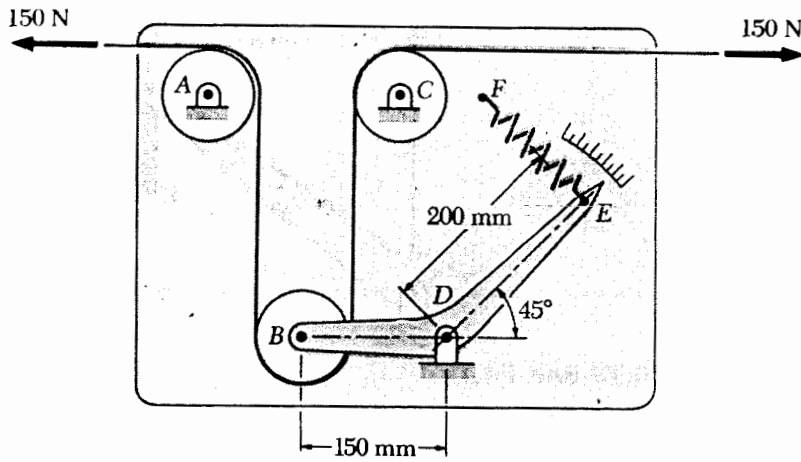


Fig. P3

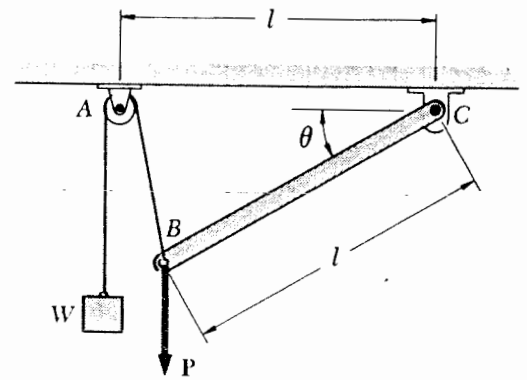


Fig. P4

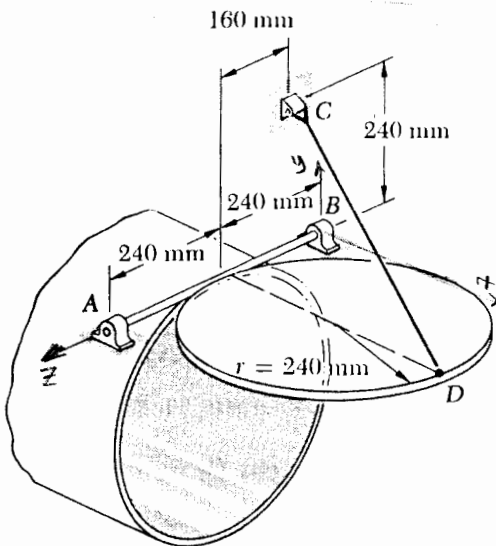


Fig. P5 A

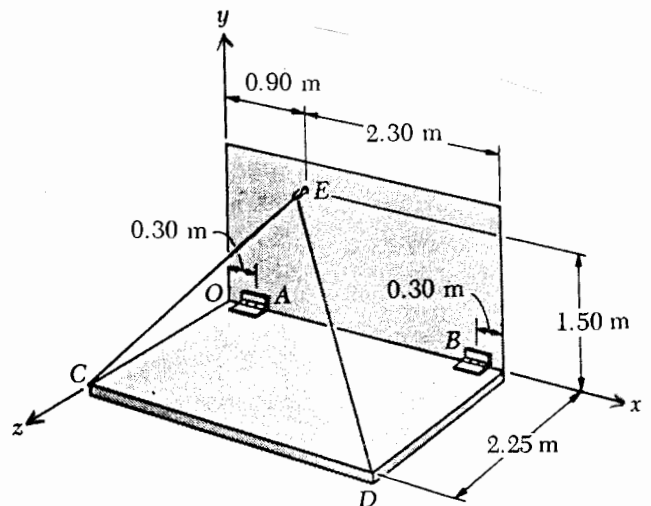


Fig. P5 B