King Fahd University of Petroleum & Minerals
CIVIL ENGINEERING DEPARTMENT

CE 201 STATICS (Sections 4 & 6)

First Semester 1429-30 / 2008-09 (**081**)

H.W. # 6

Due on Wednesday 28-11-1429 / 26-11-2008 **(any time)**

Deadline for submission: **Saturday 1-12-1429 / 29-11-2008 (before you sit in class)**

1- The tension in cable AB, shown in Fig. P1, is 2 kN. What are the reactions at C in the two cases (a) and (b)? [Secs. 5.1 - 5.4] (20 pts.)

2- The unstretched length of the spring CD, shown in Fig. P2, is 350 mm. Suppose that you want the lever ABC to exert a 120-N normal force on the smooth surface at A. Determine the necessary value of the spring constant k and the resulting reactions at B. [Secs. 5.1 - 5.4] (15 pts.)

3- As shown in Fig. P3, the airplane's weight is $W = 2400$ lb. Its brakes keep the rear wheels locked. The front (nose) wheel can turn freely, and so the ground exerts no horizontal force on it. The force T exerted by the airplane's propeller is horizontal. Determine the reaction exerted on the nose wheel and the total normal reaction exerted on the rear wheel when [Secs. 5.1 - 5.4] (20 pts.)

(a) $T = 0$,
(b) $T = 250$ lb.

4- In Fig. P4, the car's brakes keep the rear wheels locked, and the front wheels are free to turn. Determine the forces exerted on the front and rear wheels by the road when the car is parked [Secs. 5.1 - 5.4] (25 pts.)

(a) on an upslope with $\alpha = 15°$;
(b) on a downslope with $\alpha = -15°$.

5- The lift forces on an airplane's wing are represented by eight forces, as shown in Fig. P5. The magnitude of each force is given in terms of its position x on the wing by

$$200\sqrt{1-(x/17)^2} \text{ lb.}$$

The weight of the wing is $W = 400$ lb. Determine the reactions on the wing at the root R.
[Secs. 5.1 - 5.4] (20 pts.)

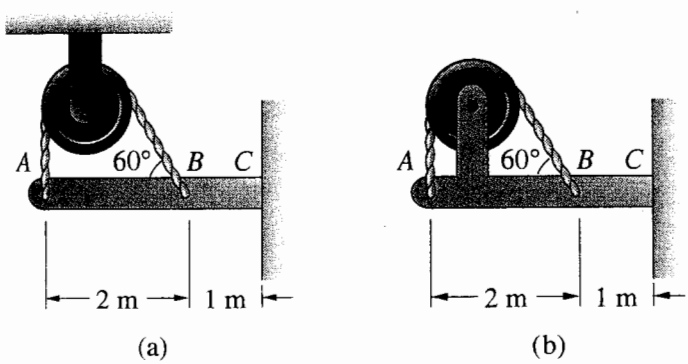


Fig. P1

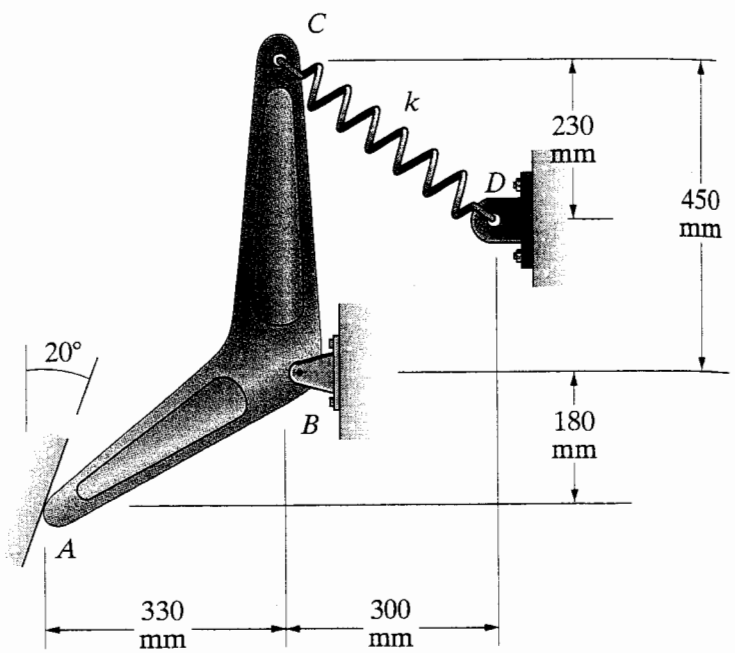


Fig P2

Fig. P3

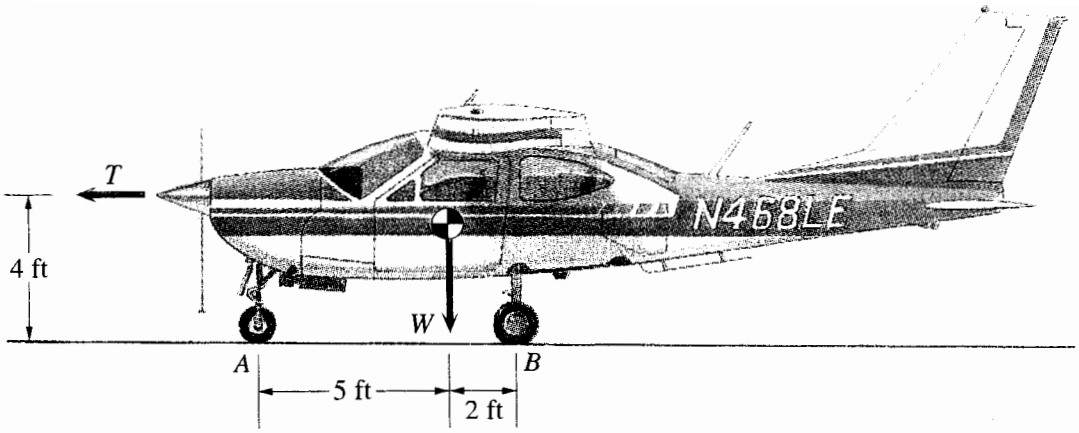


Fig. P4

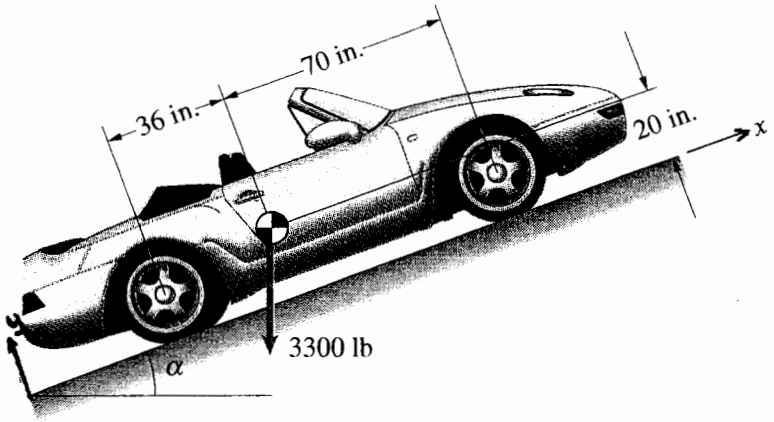
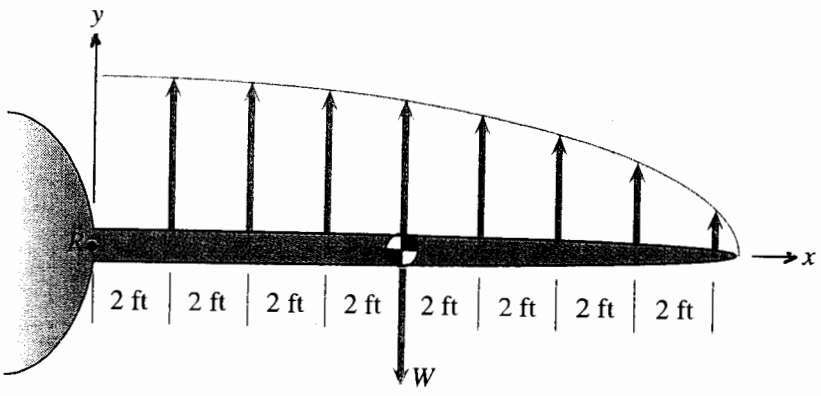


Fig. P5



Do <u>your</u> work *<u>yourself</u>*!! Remember that the homework carries about 15% 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 <u>BEFORE</u> you start solving and writing the homework. FOLLOW <u>*ALL*</u> THESE GUIDELINES.** ***<u>Cheating, copying, etc. is ……..!!!!!!</u>