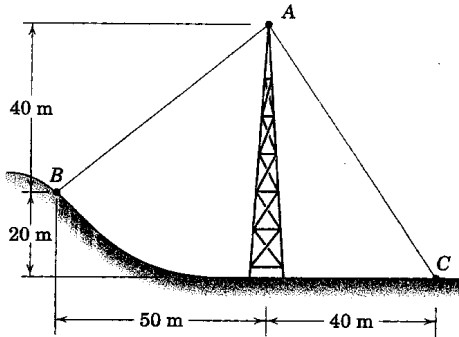


2/25 The guy cables  $AB$  and  $AC$  are attached to the top of the transmission tower. The tension in cable  $AC$  is 8 kN. Determine the required tension  $T$  in cable  $AB$  such that the net effect of the two cable tensions is a downward force at point  $A$ . Determine the magnitude  $R$  of this downward force.

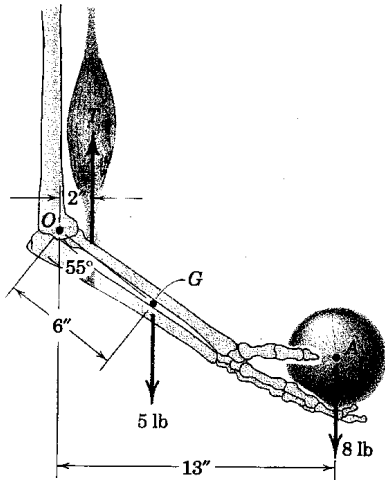
Ans.  $T = 5.68$  kN,  $R = 10.21$  kN



Problem 2/25

2/35 Elements of the lower arm are shown in the figure. The weight of the forearm is 5 lb with mass center at  $G$ . Determine the combined moment about the elbow pivot  $O$  of the weights of the forearm and the sphere. What must the biceps tension force be so that the overall moment about  $O$  is zero?

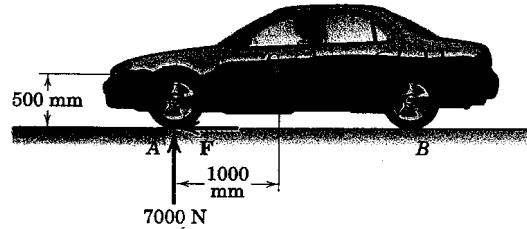
Ans.  $M_O = 128.6$  lb-in. CW,  $T = 64.3$  lb



Problem 2/35

2/71 The combined drive wheels of a front-wheel-drive automobile are acted on by a 7000-N normal reaction force and a friction force  $F$ , both of which are exerted by the road surface. If it is known that the resultant of these two forces makes a  $15^\circ$  angle with the vertical, determine the equivalent force-couple system at the car mass center  $G$ . Treat this as a two-dimensional problem.

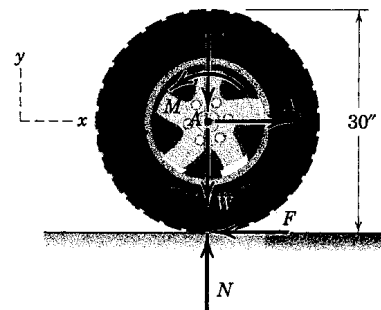
Ans.  $R = 7250$  N  
 $M_G = 7940$  N·m CW



Problem 2/71

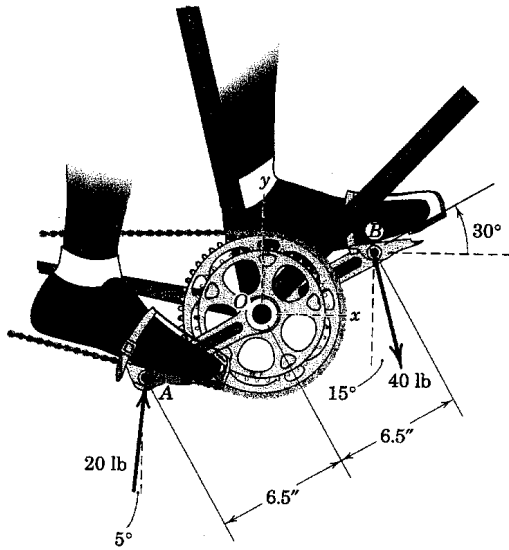
2/89 The rolling rear wheel of a front-wheel-drive automobile which is accelerating to the right is subjected to the five forces and one moment shown. The forces  $A_x = 60$  lb and  $A_y = 500$  lb are forces transmitted from the axle to the wheel,  $F = 40$  lb is the friction force exerted by the road surface on the tire,  $N = 600$  lb is the normal reaction force exerted by the road surface, and  $W = 100$  lb is the weight of the wheel/tire unit. The couple  $M = 2$  lb-ft is the bearing friction moment. Determine and locate the resultant of the system.

Ans.  $R = 20i$  lb,  $d = 2.40$  ft above  $A$



Problem 2/89

**2/92** The pedal-chainwheel unit of a bicycle is shown in the figure. The left foot of the rider exerts the 40-lb force, while the use of toe clips allows the right foot to exert the nearly upward 20-lb force. Determine the equivalent force-couple system at point  $O$ . Also, determine the equation of the line of action of the system resultant treated as a single force  $R$ . Treat the problem as two-dimensional.



**Problem 2/92**