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$\cdot$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. $R = 204$ lb, $d = 2.40$ ft above $A$

![Problem 2/89]
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.