63. The center of gravity of a loaded truck depends on how the truck is packed. If it is 4.0 m high and 2.4 m wide, and its CG is 2.2 m above the ground, how steep a slope

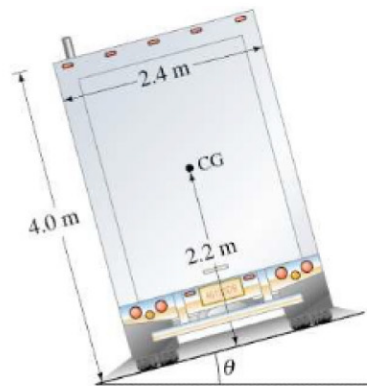be parked on without tipping over (Fig. 9–75)?

FIGURE 9–75
Problem 63.

64. In Fig. 9–76, consider the right-hand (northernmost) section of the Golden Gate Bridge, which has a length $d_1 = 343$ m. Assume the CG of this span is halfway between the tower and anchor. Determine F_{T1} and F_{T2} (which act on the northernmost cable) in terms of mg, the weight of the northernmost span, and calculate the tower height h needed for equilibrium. Assume the roadway is supported only by the suspension cables, and neglect the mass of the cables and vertical wires. [Hint: F_{T3} does not act on this section.]
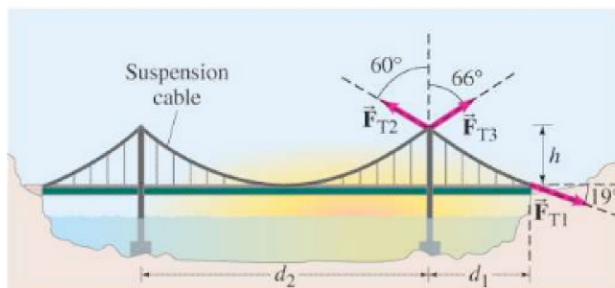

FIGURE 9–76   Problem 64.

65. When a mass of 25 kg is hung from the middle of a fixed straight aluminum wire, the wire sags to make an angle of $12°$ with the horizontal as shown in Fig. 9–77. Determine the radius of the wire.
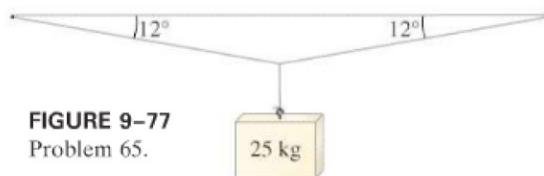

FIGURE 9–77
Problem 65.

66. The forces acting on a 67,000-kg aircraft flying at constant velocity are shown in Fig. 9–78. The engine thrust, $F_T = 5.0 \times 10^5$ N, acts on a line 1.6 m below the CM. Determine the drag force F_D and the distance above the CM that it acts. Assume $\vec{F}_D$ and $\vec{F}_T$ are horizontal.
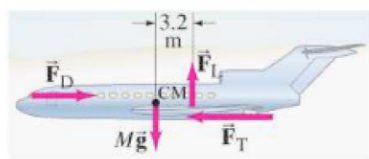

FIGURE 9–78
Problem 66.

67. A uniform flexible steel cable of weight mg is suspended between two points at the same elevation as shown in Fig. 9–79, where $\theta = 60°$. Determine the tension in the cable (a) at its lowest point, and (b) at the points of attachment. (c) What is the direction of the tension force in each case?

FIGURE 9–79
Problem 67.

68. A 20.0-m-long uniform beam weighing 550 N rests on walls A and B, as shown in Fig. 9–80. (a) Find the maximum weight of a person who can walk to the extreme end D without tipping the beam. Find the forces that the walls A and B exert on the beam when the person is standing: (b) at D; (c) at a point 2.0 m to the right of B; (d) 2.0 m to the right of A.
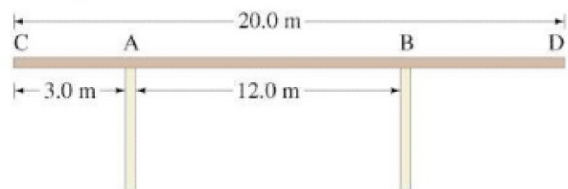

FIGURE 9–80   Problem 68.

69. A cube of side l rests on a rough floor. It is subjected to a steady horizontal pull F, exerted a distance h above the floor as shown in Fig. 9–81. As F is increased, the block will either begin to slide, or begin to tip over. Determine the coefficient of static friction μ_s so that (a) the block begins to slide rather than tip; (b) the block begins to tip. [Hint: Where will the normal force on the block act if it tips?]

FIGURE 9–81
Problem 69.
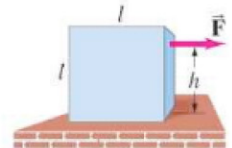
70. A 60.0-kg painter is on a uniform 25-kg scaffold supported from above by ropes (Fig. 9–82). There is a 4.0-kg pail of paint to one side, as shown. Can the painter walk safely to both ends of the scaffold? If not, which end(s) is dangerous, and how close to the end can he approach safely?

FIGURE 9–82
Problem 70.
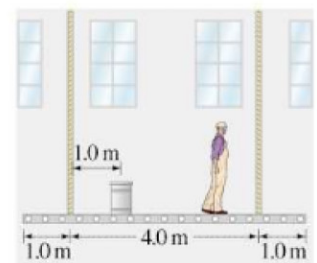
71. A woman holds a 2.0-m-long uniform 10.0-kg pole as shown in Fig. 9–83. (a) Determine the forces she must exert with each hand (magnitude and direction). To what position should she move her left hand so that neither hand has to exert a force greater than (b) 150 N? (c) 85 N?

FIGURE 9–83
Problem 71.