Practice Friction Problems – answers are on the next page

1. A desk has a mass of 2.5 kilograms. If the coefficient of static friction between the desk and the floor is 0.04, what force must be used to move the desk from rest?

2. Once the desk above is in motion, what force must be used to keep it moving at a constant velocity if the coefficient of kinetic friction is 0.0267?

3. A 945-kg car traveling rightward at 22.6 m/s slams on the brakes and skids to a stop (with locked wheels). If the coefficient of friction between tires and road is 0.972, determine the distance required to stop.

4. Splash Mountain at Disney World in Orlando, Florida is one of the steepest water plume rides in the United States. Occupants of the boat fall from a height of 100 feet (3.2 ft = 1 m) down a wet ramp which makes a 45 degree angle with the horizontal. Consider the mass of the boat and its occupants to be 1500 kg. The coefficient of friction between the boat and the ramp is 0.10. Determine the frictional force, the acceleration, the distance traveled along the incline, and the final velocity of the boat at the bottom of the incline.
Answers to problems on previous page

1. 0.981 N
2. 0.655 N
3. 26.8 m
4. $F_{\text{frict}} = \sim 2100 \text{ N}; a = \sim 5.5 \text{ m/s}^2; d = \sim 44 \text{ m}; v_f = 22 \text{ m/s}$ (answers are rounded)