95. The coefficient of kinetic friction between a jar slid across a table and the table is 0.20. What is the magnitude of the jar's acceleration?

96. A force of 5.0 N to the left causes a 1.35 kg book to have a net acceleration of 0.76 m/s^2 to the left. What is the frictional force on the book?

97. A child pulls a toy by exerting a force of 15.0 N at an angle of 55.0° with respect to the floor. What are the components of the force?

98. A car is pulled by three forces: 600.0 N to the north, 750.0 N to the east, and 675 N at 30.0° south of east. What direction does the car move?

99. Suppose a catcher exerts a force of −65.0 N to stop a baseball with a mass of 0.145 kg. What is the ball's net acceleration as it is being caught?

100. A 2.0 kg fish pulled upward by a fisherman rises 1.9 m in 2.4 s, starting from rest. What is the net force on the fish during this interval?

101. An 18.0 N force pulls a cart against a 15.0 N frictional force. The speed of the cart increases 1.0 m/s every 5.0 s. What is the cart's mass?

102. A 47 kg sled carries a 33 kg load. The coefficient of kinetic friction between the sled and snow is 0.075. What is the magnitude of the frictional force on the sled as it moves up a hill with a 15° incline?

103. Ice blocks slide with an acceleration of 1.22 m/s^2 down a chute at an angle of 12.0° below the horizontal. What is the coefficient of kinetic friction between the ice and chute?

104. A 1760 N force pulls a 266 kg load up a 17° incline. What is the coefficient of static friction between the load and the incline?

105. A 4.26×10^7 N force pulls a ship at a constant speed along a dry dock. The coefficient of kinetic friction between the ship and dry dock is 0.25. Find the normal force exerted on the ship.

106. If the incline of the dry dock in problem 105 is 10.0°, what is the ship's mass?

107. A 65.0 kg skier is pulled up an 18.0° slope by a force of 2.50×10^2 N. If the net acceleration uphill is 0.44 m/s^2, what is the frictional force between the skis and the snow?

108. Four forces are acting on a hot-air balloon: $\mathbf{F_1}$ = 2280.0 N up, $\mathbf{F_2}$ = 2250.0 N down, $\mathbf{F_3}$ = 85.0 N west, and $\mathbf{F_4}$ = 12.0 N east. What is the direction of the net external force on the balloon?

109. A traffic signal is supported by two cables, each of which makes an angle of 40.0° with the vertical. If each cable can exert a maximum force of 7.50×10^2 N, what is the largest weight they can support?

110. A certain cable of an elevator is designed to exert a force of 4.5×10^4 N. If the maximum acceleration that a loaded car can withstand is 3.5 m/s^2, what is the combined mass of the car and its contents?

111. A frictional force of 2400 N keeps a crate of machine parts from sliding down a ramp with an incline of 30.0°. The coefficient of static friction between the box and the ramp is 0.20. What is the normal force of the ramp on the box?

112. Find the mass of the crate in problem 111.

113. A 5.1×10^2 kg bundle of bricks is pulled up a ramp at an incline of 14° to a construction site. The force needed to move the bricks up the ramp is 4.1×10^3 N. What is the coefficient of static friction between the bricks and the ramp?

Chapter 5 Work and Energy

114. If 2.13×10^6 J of work must be done on a roller-coaster car to move it 3.00×10^2 m, how large is the net force acting on the car?

115. A force of 715 N is applied to a roller-coaster car to push it horizontally. If 2.72×10^4 J of work is done on the car, how far has it been pushed?

116. In 0.181 s, through a distance of 8.05 m, a test pilot's speed decreases from 88.9 m/s to 0 m/s. If the pilot's mass is 70.0 kg, how much work is done against his body?

117. What is the kinetic energy of a disk with a mass of 0.20 g and a speed of 15.8 km/s?

118. A 9.00×10^2 kg walrus is swimming at a speed of 35.0 km/h. What is its kinetic energy?

119. A golf ball with a mass of 47.0 g has a kinetic energy of 1433 J. What is the ball's speed?

120. A turtle, swimming at 9.78 m/s, has a kinetic energy of 6.08×10^4 J. What is the turtle's mass?

121. A 50.0 kg parachutist is falling at a speed of 47.00 m/s when her parachute opens. Her speed upon landing is 5.00 m/s. How much work is done by the air to reduce the parachutist's speed?

122. An 1100 kg car accelerates from 48.0 km/h to 59.0 km/h over 100.0 m. What was the magnitude of the net force acting on it?