

Name \_\_\_\_\_ Period \_\_\_\_\_ Date \_\_\_\_\_

Work, Power, and Energy  
Mixed Word Problems

1. How much work is done on a vacuum cleaner pulled 3.0 m by a force of 50.0 N at an angle of  $30.0^\circ$  above the horizontal?
2. A shopper in a supermarket pushes a cart with a force of 35 N directed at an angle of  $25^\circ$  downward from the horizontal. Find the work done by the shopper on the cart as the shopper moves along a 50.0 m length of aisle.
3. A 77 kg diver drops from a board 10.0 m above the water's surface. Find the diver's speed just before striking the water.
4. A pendulum bob is released from some initial height such that the speed of the bob at the bottom of the swing is 1.9 m/s. What is the initial height of the bob?
5. Starting from rest, a child zooms down a frictionless slide from an initial height of 3.00 m. What is her kinetic energy at the bottom of the slide? Assume she has a mass of 25.0 kg.
6. A blue whale can shoot out water from its blowhole to a vertical height of 3 m. With what velocity does the water leave the whale's blowhole? (Disregard air resistance.  $g = 9.81 \text{ m/s}^2$ .)
7. What is the average power supplied by a 50.0 kg student running up the school stairs rising vertically 6.0 m in 5.7 s? ( $g = 9.81 \text{ m/s}^2$ .)
8. A 193 kg curtain uses a motor to raise it 7.5 m in 5.0 s. What is the power rating of the motor?
9. A paperclip with a mass of 0.01 kg is thrown vertically upward with a velocity of 10 m/s. How high will the paperclip reach?
10. Each step of a staircase increases one's vertical height 0.30 m. If a 70.0 kg student walks 14 steps up the stairs, what is the increase in potential energy?

1) 130 J 2)  $1.6 \times 10^3 \text{ J}$  3) 14 m/s 4) 0.18 m 5) 736 J 6) 7.67 m/s 7) 516.32 watts 8) 2.8 kW 9) 5.10 m 10) 2884 J