Name:

Physics 11
M. Lam

More to Work On

Block:

1. How much work is done when a 200 N force is used to slide a 30 kg box 6.0 m across a room?

2. A person on a bicycle produces a forward force of 200 N and is travelling 3.0 m/s. What power is being produced?

3. What power is needed to lift a 1000 kg load 10 m to the top of a construction site in 1.0 minute?

4. A 1500 kg car accelerates from rest at 2.0 m/s^2 for a distance of 250 m.
   a) Neglecting friction, how much work was done in accelerating the car?
   b) When the acceleration is over, what is the kinetic energy of the car?
   c) What is the speed of the car?

5. A 150 W motor is used to raise a garage door. If the average force needed to lift the door is 600 N, how much time will it take to raise the door 2.5 m?

6. What is the potential energy stored in a cubic meter of water (1000 kg) that is in a reservoir behind a dam at a height of 60 m above the elevation of the turbines the water will be used to turn?

7. In an experiment, a small 20 W motor is used to lift a 100 g mass through a vertical distance.
   a) If the motor runs for 40 s, how much potential energy does the mass gain?
   b) How high can the mass be lifted in 40 s?

8. What is the kinetic energy of a 1200 kg car travelling 90 km/h?

9. What unit is equivalent to a J/s?

10. A 200 W motor runs a pump to move water from a stream into a stooge tank 10 m above the elevation of the stream. How many litres of water can the pump move in 1.0 hour? (recall that 1.0 L of water = 1.0 kg)

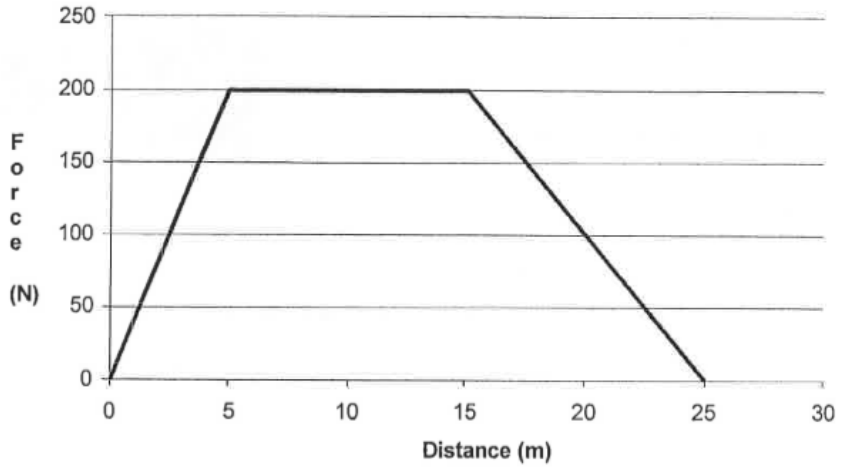
11. A 200 g mass rests on a table 2.0 m above the floor. If the mass slips off the table, what is its speed just as it reaches the floor?

12. A pendulum bob is raised in an arc to a position 20 cm higher than its lowest point. The bob is released. What is the speed of the bob as it passes through its lowest point?

13. A 3000 kg car travelling at 10 m/s rolls down a steep driveway that has a vertical drop of 5.0 m.
   a) If we ignore friction, what is the car's speed at the bottom of the incline?
   b) If we include friction, and find that the heat generated along the driveway is 50 000 J, what is the speed of the car at the bottom of the incline?

14. A 73 kg skier starts at rest at the top of a 100 m high hill. He skies down this hill and back up a 60 m high hill. If the speed of the skier at the top of the second hill is 11 m/s, how much energy was generated due to friction?

15. The graph below shows the net force on a 1050. kg car.



a) What is the work done on the car after 25 m?
b) If the car was initially at rest, what is its speed after a distance of 25 m?
c) After 25 m, the force is released and the brakes are applied. The car stops after a distance of 3m. Determine the force of friction.