

*Power*

$$P = \frac{W}{t}$$

$$P = Fv \text{ where } v \text{ is constant}$$

$$1 \text{ kW} = 1000 \text{ W}$$

1. How long does it take a 19 kW steam engine to do  $6.8 \times 10^7$  J of work?
2. A  $1.5 \times 10^3$  kg car accelerates uniformly from rest to 10 m/s in 3 s.
  - a) What work is done on the car in this time interval?
  - b) What is the power delivered by the engine in this time interval?
3. A 193 kg curtain needs to be raised 7.5 m, at constant speed, in as close to 5 s as possible. The power ratings for three motors are listed as 1 kW, 3.5 kW, and 5.5 kW. Which motor is best for the job?
4. A rain cloud contains  $2.66 \times 10^7$  kg of water vapor. How long would it take for a 2 kW pump to raise the same amount of water to the cloud's altitude, 2 km?
5. The Cyclone is a roller coaster that ascends a 34.1 m hill and then drops. The train of cars has a mass of 4727 kg. How much power is generated to bring the train to the top of the hill in 30 s?
6. Water flows over a section of Niagara Falls at the rate of  $1.2 \times 10^6$  kg/s and falls 50 m. How much power is generated by the falling water?