### 2.5 Potential Energy

1. Calculate the potential energy that a 55.0 kg diver has standing on a 10.0 m platform.
2. Determine the mass of a water balloon that is dropped from a height of 35 m with a potential energy of 515 J .
3. A $1.00 \times 10^{4} \mathrm{~kg}$ airplane lands, descending a vertical distance of 10.0 km while travelling 100.0 km measured along the ground. What is the plane's loss of potential energy?
4. A coconut falls out of a tree 12.0 m above the ground and hits a bystander 3.00 m tall on the top of the head. If the mass of the coconut is 2.00 kg , calculate the potential energy of the coconut relative to the ground at each of the following sites:
(a) while it is still in the tree
(b) when it hits the bystander on the head
(c) when it lands on the ground
5. Calculate the potential energy of a 5.00 kg object sitting on a 3.00 metre high ledge.
6. A 10.0 kg rock is at the top of a 20.0 m tall hill. How much potential energy does it have?

### 2.6 Kinetic Energy

1. Calculate the kinetic energy of a 0.45 -kilogram golf ball travelling at:
a) $20.0 \mathrm{~m} / \mathrm{s}$
b) $40.0 \mathrm{~m} / \mathrm{s}$
c) $60.0 \mathrm{~m} / \mathrm{s}$.
2. A 50.0 kg bicyclist on a 10.0 kg bicycle speeds up from $5.00 \mathrm{~m} / \mathrm{s}$ to $10.0 \mathrm{~m} / \mathrm{s}$. a. What was the total kinetic energy before accelerating?
b. What was the total kinetic energy after accelerating?
3. A 4.00 kg rock is rolling $10.0 \mathrm{~m} / \mathrm{s}$. Find it's kinetic energy.
4. An 8.0 kg cat is running $4.0 \mathrm{~m} / \mathrm{s}$. How much kinetic energy does it have?
