# Calculation Questions Combining Gravitational Potential Energy and Kinetic Energy Equations

1. A 0.20 kg tennis ball is dropped from a balcony 15 m above the ground. Calculate:
   a) the GPE at the start
   b) the speed just before it hits the ground.
2. A 65 kg mountain biker rides off a ledge and drops vertically by 4.0 m. Calculate:
   a) the loss in GPE
   b) the speed gained from the drop.
3. A 1500 kg car rolls down a hill with a vertical height difference of 12 m. Calculate:
   a) the GPE lost
   b) the speed of the car at the bottom if it started from rest.
4. A 2.5 kg bucket is lowered from the top of a well 18 m deep. Calculate:
   a) the GPE lost
   b) its speed just before reaching the bottom.
5. A 0.050 kg conker falls from a tree branch 25 m above the ground. Calculate:
   a) the GPE at the start
   b) its speed just before impact.
6. A 500 kg roller coaster car descends 35 m from the highest point of the track. Calculate:
   a) the GPE lost
   b) its speed at the bottom.
7. A 75 kg climber abseils down a cliff face and descends vertically by 8.0 m. If all GPE were converted to KE, calculate:
   a) the GPE lost
   b) the climber's speed.
8. A 0.80 kg science trolley rolls off a bench that is 1.2 m high. Calculate:

a) the GPE lost
b) the speed of the trolley just before it hits the floor.

9. A 2000 kg lift descends 30 m in a building. Calculate:
   a) the decrease in GPE
   b) the speed the lift would reach if all GPE became KE.
10. A 90 kg skier starts from rest and descends a slope with a vertical drop of 50 m. Calculate:
   a) the GPE lost
   b) the speed of the skier at the bottom.