1. A body with constant acceleration starts with velocity 15 m/s. At the end of the eleventh second its velocity is 48 m/s. What is its acceleration?

2. A body starts from a fixed point *O* with initial velocity −10 m/s and uniform acceleration 4 m/s2. Find:
a the displacement of the particle from *O* after six seconds
b the velocity of the particle after six seconds
c the time when the velocity is zero
d the distance travelled in the first six seconds

3. **a** A stone is thrown vertically upwards from ground level at 21 m/s.
i What is its height above the ground after two seconds?
ii What is the maximum height reached by the stone?
b If the stone is thrown vertically upwards from a cliff 17.5 m high at 21 m/s:
i how long will it take to strike the ground at the base of the cliff?
ii what is the velocity of the stone when it hits the ground?

4. A basketball is thrown vertically upwards with a velocity of 14 m/s. Find:
a the time taken by the ball to reach its maximum height
b the greatest height reached by the ball
c the time taken for the ball to return to the point from which it is thrown

5. A car sliding on ice is decelerating at the rate of 0.1 m/s2. Initially the car is travelling at 20 m/s. Find:
a the time taken before it comes to rest
b the distance travelled before it comes to rest

6. An object is dropped from a point 100 m above the ground. The acceleration due to gravity is 9.8 m/s2. Find:
a the time taken by the object to reach the ground
b the velocity at which the object hits the ground

7. An object is projected vertically upwards from a point 50 m above ground level (acceleration due to gravity is 9.8 m/s2). If the initial velocity is 10 m/s, find:
a the time taken by the object to reach the ground (give answer correct to two decimal places)
b the velocity at that point

8. A book is pushed across a table and is subjected to a retardation of 0.8 m/s2 due to friction (retardation is acceleration opposite in direction to motion). If the initial speed of the book is 1 m/s, find:
a the time taken for the book to stop
b the distance over which the book slides

9. A box is pushed across a bench and is subjected to a constant retardation, a m/s2, due to friction. The initial speed of the box is 1.2 m/s and the box travels 3.2 m before stopping. Find:
a the value of a
b the time taken by the box before it comes to rest

10. A particle travels in a straight line with a constant velocity of 4 m/s for 12 seconds. It is then subjected to a constant acceleration in the opposite direction for 20 seconds which returns the particle to its original position. Find:
a the acceleration of the particle
b the time the particle is travelling back towards its original position

11. A child slides from rest down a slide 4 m long. The child undergoes constant acceleration and reaches the end of the slide travelling at 2 m/s. Find:
a the time taken to go down the slide
b the acceleration which the child experiences