

9E Movement Under Gravity

1. A ball is projected vertically upwards from a point O with a speed of 12ms^{-1} . Find:

a) The greatest height reached by the ball

b) The total time the ball is in the air

2. A book falls off the top shelf of a bookcase. The shelf is 1.4m above the ground. Find:

a) The time it takes the book to reach the floor

b) The speed with which the book strikes the floor

3. A ball is projected upwards from a point X which is 7m above the ground, with initial speed 21ms^{-1} . Find the time of flight of the ball.

4. A particle is projected vertically upwards from a point O with initial speed $u \text{ ms}^{-1}$. The greatest height reached by the particle is 62.5m above the ground. Find:
- a) The speed of projection

- b) The total time for which the ball is 50m or more above the ground

5. A ball, A, falls vertically from rest from the top of a tower 63m high. At the same time as A begins to fall, another ball, B, is projected vertically upwards from the bottom of the tower with velocity 21ms^{-1} . The balls collide. Find the height at which this happens.