

Solutionbank M1

Heinemann Modular Maths for Edexcel AS and A-level

7 Projectiles

Exercise Test yourself, Question 2

Question:

A bullet is fired horizontally at a speed of 100 m s^{-1} from a height of 3 m.

- (a) Find the time when the bullet hits the ground.
 (b) Find the horizontal distance travelled by the bullet.

Solution:

(a) Position of bullet relative to the point of firing is given by

$$x = 100t$$

$$y = -\frac{1}{2}gt^2$$

The bullet hits the ground when $y = -3$,

$$\therefore -3 = -\frac{1}{2}gt^2$$

$$t = \sqrt{\frac{6}{g}} = 0.7824 \text{ s}$$

Time is 0.782 s

- (b) Horizontal distance, x is 100×0.782
 $= 78.2 \text{ m}$