Solutionbank M1

Heinemann Modular Maths for Edexcel AS and A-level

7 Projectiles

Exercise A, Question 3

Question:

A bushbaby makes hops with a take-off speed of 6 m s^{-1} and at an angle of 30° to the horizontal. How far does it go in each hop?

Solution:

Equations of motion for a projectile give

$x = 6 \cos 30° t$

$y = 6 \sin 30° t - \frac{1}{2}gt^2$

Bushbaby lands when $y = 0$

$\Rightarrow \quad 6 \sin 30° t - \frac{1}{2}gt^2 = 0$

$t = \frac{6 \sin 30°}{\frac{1}{2}g}$ or 0 (not required)

$= 0.6122$ s

$\therefore$ Distance, $x = 6 \cos 30° \times 0.6122$

$= 3.18$ m.