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6. A small ball is projected vertically upwards with speed $U\,\text{m s}^{-1}$ from a point A that is 12.5 m above horizontal ground. The ball moves freely under gravity until it hits the ground $\frac{25}{7}$ s later. By modelling the ball as a particle,

(a) find the value of U.

(3)

After hitting the ground the ball rebounds vertically and comes to instantaneous rest at the point B, $\frac{5}{7}$ s after hitting the ground.

(b) Find the height of B above the ground.

(3)

(c) Sketch a velocity-time graph for the motion of the ball from the instant when it was first projected from A to the instant when it comes to instantaneous rest at B.

[*No further calculations are needed in order to draw this sketch*.]

(3)

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