

- 2 A ball is thrown from A to B as shown in Fig. 2.1.

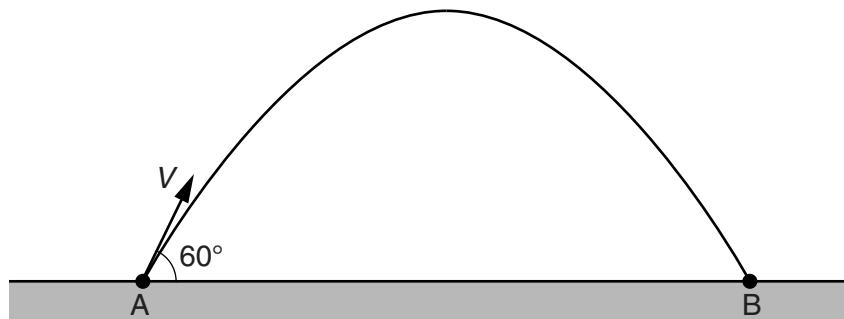


Fig. 2.1

The ball is thrown with an initial velocity V at 60° to the horizontal.

The variation with time t of the vertical component V_v of the velocity of the ball from $t = 0$ to $t = 0.60\text{ s}$ is shown in Fig. 2.2.

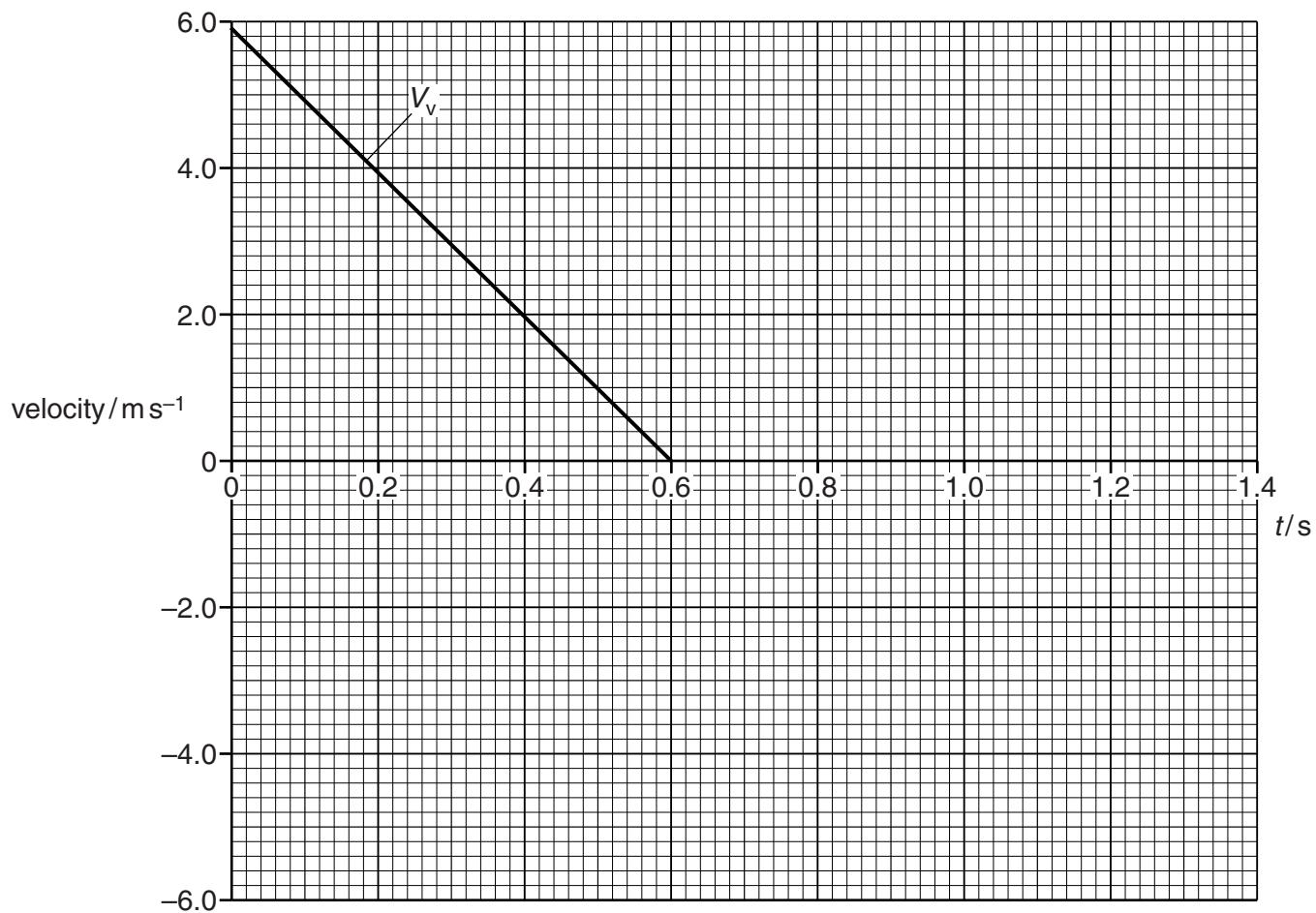


Fig. 2.2

Assume air resistance is negligible.

(a) (i) Complete Fig. 2.2 for the time until the ball reaches B. [2]

(ii) Calculate the maximum height reached by the ball.

$$\text{height} = \dots \text{m} [2]$$

(iii) Calculate the horizontal component V_h of the velocity of the ball at time $t = 0$.

$$V_h = \dots \text{ms}^{-1} [2]$$

(iv) On Fig. 2.2, sketch the variation with t of V_h . **Label** this sketch V_h . [1]

(b) The ball has mass 0.65 kg.

Calculate, for the ball,

(i) the maximum kinetic energy,

$$\text{maximum kinetic energy} = \dots \text{J} [3]$$

(ii) the maximum potential energy above the ground.

$$\text{maximum potential energy} = \dots \text{J} [2]$$