

2 (a) Define *velocity*.

.....  
.....[1]

(b) A ball of mass 0.45 kg leaves the edge of a table with a horizontal velocity  $v$ , as shown in Fig. 2.1.

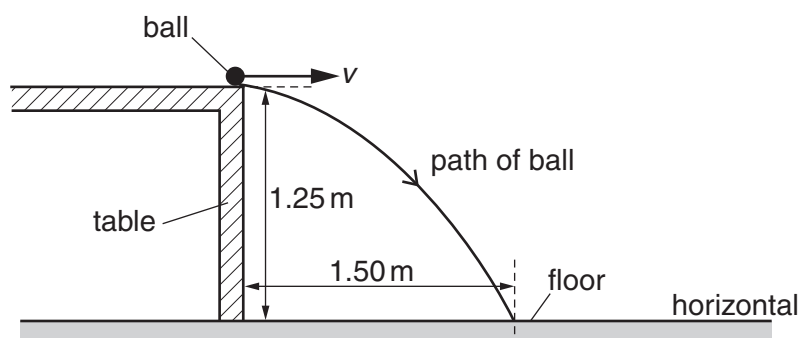


Fig. 2.1

The height of the table is 1.25 m. The ball travels a distance of 1.50 m horizontally before hitting the floor.

Air resistance is negligible.

Calculate, for the ball,

(i) the horizontal velocity  $v$  as it leaves the table,

$v = \dots\dots\dots \text{ms}^{-1}$  [3]

(ii) the velocity just as it hits the floor,

magnitude of velocity = .....ms<sup>-1</sup>

angle to the horizontal = .....°  
[4]

(iii) the kinetic energy just as it hits the floor,

kinetic energy = .....J [2]

(iv) the loss in gravitational potential energy as it falls from the table to the floor.

loss in potential energy = .....J [2]

(c) Explain why the kinetic energy of the ball in (b)(iii) does not equal the loss of gravitational potential energy in (b)(iv).

.....  
.....[1]

[Total: 13]