Answer **all** the questions in the spaces provided.

**1** **(a)** Complete Fig. 1.1 to indicate whether each of the quantities is a vector or a scalar.

| quantity | vector or scalar |
|---|---|
| acceleration | |
| speed | |
| power | |

**Fig. 1.1**

[2]

**(b)** A ball is projected with a horizontal velocity of $1.1 \, m \, s^{-1}$ from point A at the edge of a table, as shown in Fig. 1.2.
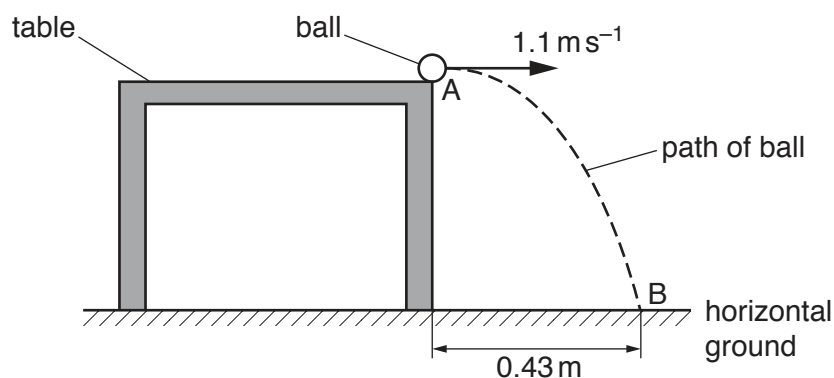


**Fig. 1.2**

The ball lands on horizontal ground at point B which is a distance of 0.43 m from the base of the table. Air resistance is negligible.

**(i)** Calculate the time taken for the ball to fall from A to B.

time = ...................................................... s [1]

**(ii)** Use your answer in **(b)(i)** to determine the height of the table.

height = ...................................................... m [2]

**(iii)** The ball leaves the table at time $t = 0$.

For the motion of the ball between A and B, sketch graphs on Fig. 1.3 to show the variation with time $t$ of

1. the acceleration $a$ of the ball,

2. the vertical component $s_v$ of the displacement of the ball from A.
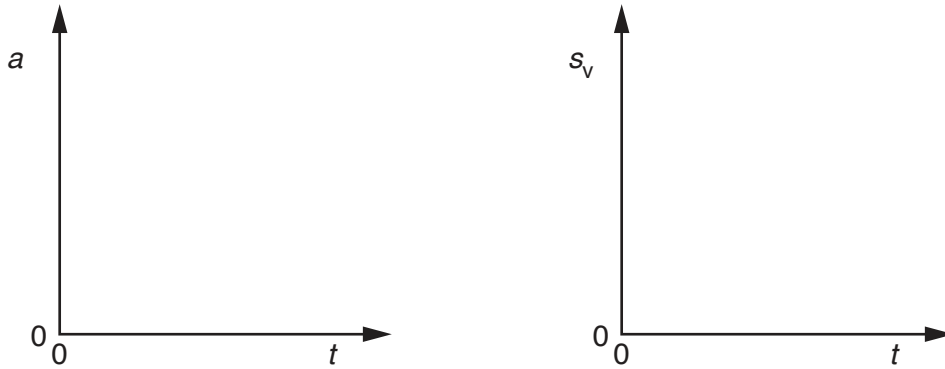
Numerical values are not required.



**Fig. 1.3**

[2]

**(c)** A ball of greater mass is projected from the table with the same velocity as the ball in **(b)**. Air resistance is still negligible.

State and explain the effect, if any, of the increased mass on the time taken for the ball to fall to the ground.

...................................................................................................................................................

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

[Total: 8]