

- 1 (a) Define acceleration.

..... [1]

- (b) In an experiment, two objects A and B are released from the side of a building, as shown in Fig. 1.1.

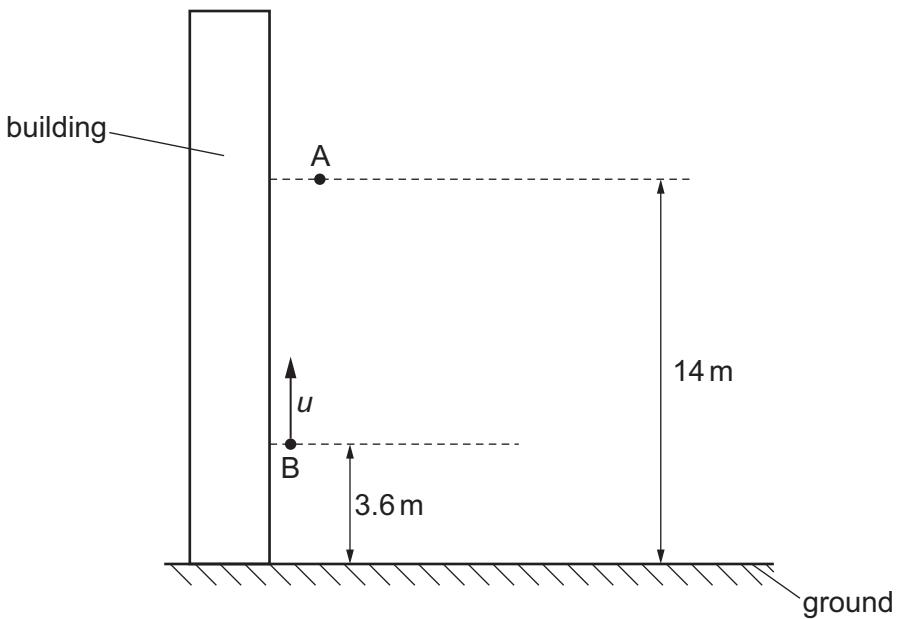


Fig. 1.1 (not to scale)

Object A is released from rest at a height of 14 m above the horizontal ground.

Object B is released with an initial upwards vertical velocity u at a height of 3.6 m above the ground.

Both objects take the same time to reach the ground and they do not collide with each other.
Air resistance is negligible.

- (i) Calculate the time taken for object A to reach the ground.

time = s [2]

- (ii) Use your answer in (b)(i) to calculate u .

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



- (c) In a second experiment, object B is released from the same height and given the same initial speed as in (b) but at a release angle θ to the vertical, as shown in Fig. 1.2.

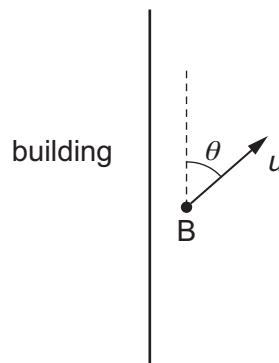


Fig. 1.2

- (i) State and explain whether the time taken for object B to reach the ground is less than, the same as or greater than the time in (b)(i).

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..... [2]

- (ii) By considering energy, state and explain the effect of the change in release angle on the speed at which B reaches the ground.

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..... [2]