

- 1 A student times the fall of a small metal ball. Data for the time t taken for the ball to fall a vertical distance h from rest are given below.

$$h = 266 \pm 1 \text{ cm}$$

$$t = 0.740 \pm 0.005 \text{ s}$$

- (a) Use these data to determine

- (i) a value, to three significant figures, of the acceleration of free fall g ,

$$\text{acceleration} = \dots\dots\dots \text{ms}^{-2} \quad [2]$$

- (ii) the percentage uncertainty, to two significant figures, of

1. the distance h ,

$$\text{uncertainty} = \dots\dots\dots \% \quad [1]$$

2. the time t .

$$\text{uncertainty} = \dots\dots\dots \% \quad [1]$$

- (b) Use your answers in (a) to determine the actual uncertainty in the value of g .

Hence give a statement of g , with its uncertainty, to an appropriate number of significant figures.

$$g = \dots\dots\dots \pm \dots\dots\dots \text{ m s}^{-2} \quad [3]$$

- (c) Suggest two reasons why, in this experiment, although the value of t is precise, it may not be accurate.

1.
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2.
..... [2]