

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

- 1 (a) The final velocity v , initial velocity u , acceleration a and displacement s of a body moving in a straight line at uniform acceleration is related by the equation

$$v^2 = u^2 + 2as$$

Show that this equation is homogenous.

[2]

- (b) A horse-riding bowman starts from rest, and accelerates uniformly over a distance s and to a velocity v .
The measured values of s and v are

$$s = (5.0 \pm 0.2) \text{ m}$$

$$v = (7.7 \pm 0.3) \text{ m s}^{-1}$$

- (i) Calculate the acceleration a of the horse.

$$a = \dots\dots\dots \text{m s}^{-2} \quad [1]$$

- (ii) Calculate the absolute uncertainty of the acceleration of the horse, Δa .

$$\Delta a = \dots\dots\dots \text{m s}^{-2} \quad [2]$$

- (iii) Express a together with its associated uncertainty.

$$a \pm \Delta a = \dots\dots\dots \pm \dots\dots\dots \text{m s}^{-2} \quad [1]$$



- (c) In a shooting competition, bowmen shoot at the centre of a target board 6 times. The target boards of two bowmen, A and B, are shown in Fig 1.1.

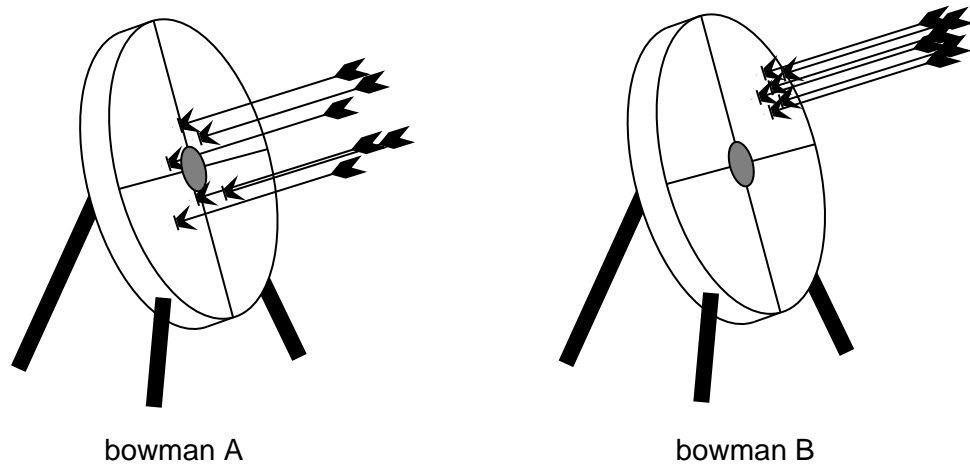


Fig 1.1

State and explain which of the bowmens' shooting is considered to be more

- (i) accurate.

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 [2]

- (ii) precise.

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 [2]