

HL Paper 1

The volume V of a cylinder of radius R and height H is given by $V = \pi R^2 H$. The volume of the cylinder was measured with an uncertainty of 10% and the height was measured with an uncertainty of 6%. What is the uncertainty in the radius of the cylinder?

- A. 1%
- B. 2%
- C. 4%
- D. 8%

Markscheme

D

Examiners report

When calculating uncertainties a distinction must be made between what is measured and what is calculated. The calculated should be made the subject of the formula before proceeding.

Two lengths, a and b , are measured to be 51 ± 1 cm and 49 ± 1 cm respectively. In which of the following quantities is the percentage uncertainty the largest?

- A. $a + b$
- B. $a - b$
- C. $a \times b$
- D. $\frac{a}{b}$

Markscheme

B

Examiners report

[N/A]

- A. $1.60 \times 10^{-12} \mu\text{C}$
- B. $1.60 \times 10^{-15} \text{mC}$
- C. $1.60 \times 10^{-22} \text{kC}$
- D. $1.60 \times 10^{-24} \text{MC}$

Markscheme

C

Examiners report

[N/A]

A ball is thrown with velocity u at an angle of 55° above the horizontal. Which of the following is the magnitude of the horizontal component of velocity?

- A. $u \cos 55^\circ$
- B. $u \sin 55^\circ$
- C. u
- D. $u \tan 55^\circ$

Markscheme

A

Examiners report

Which of the following expresses the units of capacitance in terms of fundamental units?

- A. $\text{s}^4 \text{A}^2 \text{m}^{-2} \text{kg}^{-1}$
- B. $\text{s}^2 \text{Am}^{-2} \text{kg}^{-1}$
- C. $\text{s}^4 \text{A}^2 \text{m}^{-2}$
- D. $\text{s}^2 \text{Am}^{-2}$

Markscheme

A

