

- 1 (a) Table 1.1 lists some physical quantities. Complete the table by placing a tick (✓) next to the scalar quantities.

Table 1.1

acceleration	
charge	
momentum	
power	
upthrust	

[1]

- (b) A uniform cylinder has diameter D , length L and mass M .
The density ρ of the cylinder is given by

$$\rho = \frac{4M}{\pi D^2 L}.$$

Table 1.2 shows the data obtained from an experiment to determine the density of the cylinder.

Table 1.2

quantity	measurement	percentage uncertainty
D	$(26.2 \pm 0.1) \text{ mm}$%
L	$(162 \pm 1) \text{ mm}$%
M	$(247 \pm 1) \text{ g}$	0.4%

- (i) Calculate the percentage uncertainties in D and L . Write your answers in Table 1.2.

[1]

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(ii) Calculate the density of the cylinder. Give your answer to three significant figures.

density = kg m^{-3} [2]

(iii) Calculate the percentage uncertainty in the density.

percentage uncertainty = % [2]