

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

1 (a) Make estimates of

(i) the mass, in kg, of a wooden metre rule,

mass = kg [1]

(ii) the volume, in cm^3 , of a cricket ball or a tennis ball.

volume = cm^3 [1]

(b) A metal wire of length L has a circular cross-section of diameter d , as shown in Fig. 1.1.

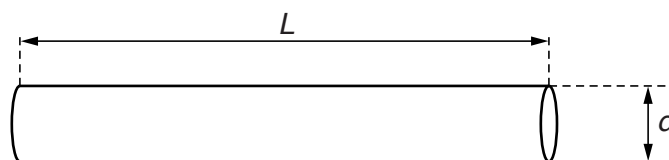


Fig. 1.1

The volume V of the wire is given by the expression

$$V = \frac{\pi d^2 L}{4}.$$

The diameter, length and mass M are measured to determine the density of the metal of the wire. The measured values are:

$$d = 0.38 \pm 0.01 \text{ mm},$$

$$L = 25.0 \pm 0.1 \text{ cm},$$

$$M = 0.225 \pm 0.001 \text{ g}.$$

Calculate the density of the metal, with its absolute uncertainty. Give your answer to an appropriate number of significant figures.

density = kg m^{-3} [5]

[Total: 7]