

2 The time T for a satellite to orbit the Earth is given by

$$T = \sqrt{\left(\frac{KR^3}{M}\right)}$$

where R is the distance of the satellite from the centre of the Earth,
 M is the mass of the Earth,
 and K is a constant.

(a) Determine the SI base units of K .

SI base units of K [2]

(b) Data for a particular satellite are given in Fig. 2.1.

quantity	measurement	uncertainty
T	$8.64 \times 10^4 \text{ s}$	$\pm 0.5\%$
R	$4.23 \times 10^7 \text{ m}$	$\pm 1\%$
M	$6.0 \times 10^{24} \text{ kg}$	$\pm 2\%$

Fig. 2.1

Calculate K and its actual uncertainty in SI units.

$K = \dots\dots\dots \pm \dots\dots\dots$ SI units [4]