1 **(a)** The intensity I of a sound wave moving through a gas is given by

$$I = f^2 A^2 v k$$

where f is the frequency of the wave,

A is the amplitude of the wave,

v is the speed of the wave

and k is a constant that depends on the gas.

Determine the SI base units of k.

SI base units = ... [3]

(b) The maximum useful output power P of a car travelling on a horizontal road is given by

$$P = v^3 b$$

where v is the maximum speed of the car and b is a constant.

For the car,

$P = 84 \text{ kW} \pm 5\%$

and $b = 0.56 \pm 7\%$ in SI units.

Determine the absolute uncertainty in the value of *v*.

absolute uncertainty = ... m s^{-1} [3]