

- 2 The pressure p of an ideal gas is given by the expression

$$p = \frac{1}{3} \frac{Nm}{V} \langle c^2 \rangle.$$

- (a) Explain the meaning of the symbol $\langle c^2 \rangle$.

.....
..... [2]

- (b) The ideal gas has a density of 2.4 kg m^{-3} at a pressure of $2.0 \times 10^5 \text{ Pa}$ and a temperature of 300 K.

- (i) Determine the root-mean-square (r.m.s.) speed of the gas atoms at 300 K.

r.m.s. speed = m s^{-1} [3]

- (ii) Calculate the temperature of the gas for the atoms to have an r.m.s. speed that is twice that calculated in (i).

temperature = K [3]