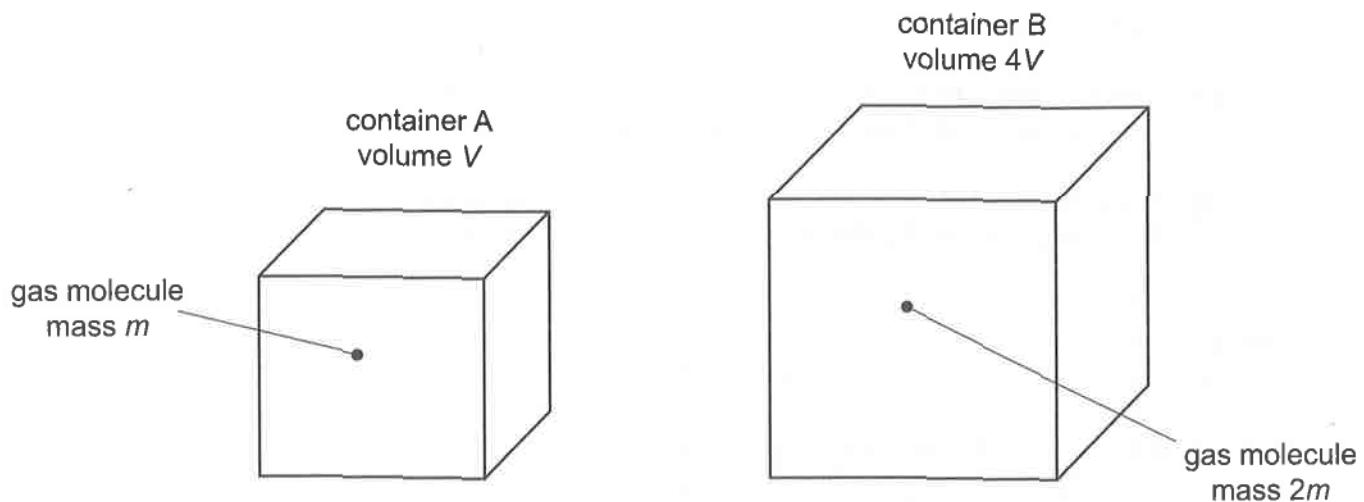


- 6 Two containers A and B contain ideal gases, as shown in Fig. 6.1.



**Fig. 6.1** (not to scale)

The volume of container A is  $V$ , and the volume of container B is  $4V$ .

The molecules of the gas in container A each have mass  $m$  and those in container B each have mass  $2m$ .

The gases in the containers are at the same temperature and pressure.

(a) Deduce a value for the ratio:

(i) 
$$\frac{\text{mean kinetic energy of a gas molecule in container A}}{\text{mean kinetic energy of a gas molecule in container B}}$$

ratio = ..... [1]





(ii)

number of gas molecules in container A  
number of gas molecules in container B

ratio = ..... [1]

(iii)

root-mean-square (r.m.s.) speed of gas molecules in container A  
r.m.s. speed of gas molecules in container B

ratio = ..... [2]

(b) There are 1.6 moles of gas in container A. The gas in container A has a molar mass of 4.0 g.

The r.m.s. speed of the molecules in container B is  $940 \text{ ms}^{-1}$ .

Calculate the temperature of the gases.

temperature of gases = ..... K [4]

[Total: 8]

