Question Number	Answer	Mark
13(a)	Use of $pV = NkT$ (1) Temperature converted to kelvin (1) $V = 6.9\ \text{m}^3$ (1) Example of calculation $\frac{pV}{T} = \text{a constant}$ $\frac{8.4 \times 10^4\ \text{Pa} \times V}{(273 - 48)\ \text{K}} = \frac{1.02 \times 10^5\ \text{Pa} \times 7.50\ \text{m}^3}{(273 + 22.5)\text{K}}$ $\therefore V = \frac{1.02 \times 10^5\ \text{Pa} \times 7.5\ \text{m}^3 \times (273 - 48)\ \text{K}}{(273 + 22.5)\text{K} \times 8.4 \times 10^4\ \text{Pa}} = 6.93\ \text{m}^3$	**3**
13(b)	Use of $\frac{1}{2}m\langle c^2\rangle = \frac{3}{2}kT$ (1) Decrease = 1.5×10^{-21} J (1) Example of calculation $\Delta(\text{mean kinetic energy}) = \frac{3}{2}1.38\ \times 10^{-2}\ \ \text{J K}^{-1}(-48 - 22.5)\text{K}$ $\therefore \Delta(\text{mean kinetic energy}) = -1.46 \times 10^{-21}\ \text{J}$	**2**
	Total for question 13	**5**