**3** **(a)** Explain qualitatively how molecular movement causes the pressure exerted by a gas.

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[3]

**(b)** A fixed mass of neon gas has a pressure of $1.02 \times 10^5$ Pa and density of 0.900 kg $m^{-3}$. Neon may be assumed to be an ideal gas.

Calculate the root-mean-square speed of neon atoms.

speed = ..... m $s^{-1}$ [2]

**(c)** The density of the neon gas in **(b)** is now varied, keeping its pressure constant.

On Fig. 3.1, sketch the variation with volume *V* of the internal energy *U* of the gas.