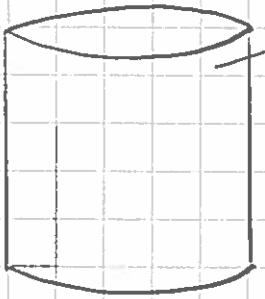

Neon (monatomic)

$p = 150\,\text{atm} = 1.519\times10^{7}\,\text{Pa}$

$T = 25^{\circ}\text{C} = 298\,\text{K}$

Mean Free Path, $\lambda = \dfrac{1}{4\sqrt{2}\,\pi\left(\frac{N}{V}\right)r^2}$

Now

$$PV = Nk_BT \Rightarrow \frac{N}{V} = \frac{P}{k_BT} = 3.694\times10^{27}\,\text{m}^3$$

$r \approx 0.5\times10^{-10}\,\text{m}$ (monatomic)

So,

$\lambda = 6.094\times10^{-9}\,\text{m}$

$\therefore \quad \dfrac{\lambda}{2r} = \underline{60.94}$

Travels ~61 atomic diameters before the next collision.