

3) Sealed cylinder ideal gas at $P = 2.0 \text{ atm}$, V does not change
rms speed = v If rms speed is reduced to $0.70v$, what
will be the new pressure?

$$PV = NkT \quad \langle K_{tr} \rangle = \frac{3}{2} kT = \frac{1}{2} m v_{rms}^2$$

$$P = \frac{2}{3} \frac{N}{V} \langle K_{tr} \rangle = \frac{2}{3} \frac{N}{V} \frac{1}{2} m v_{rms}^2$$

$$\frac{P}{2.0 \text{ atm}} = \frac{(0.70v)^2}{v^2} = 0.49$$

$$P = 0.49 (2.0 \text{ atm}) = 0.98 \text{ atm} \quad \textcircled{C}$$