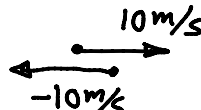


KINETIC THEORY OF GASES

AVERAGE VELOCITY OF GAS MOLECULES:

$$\vec{v}_{av} = \frac{\vec{v}_1 + \vec{v}_2 + \dots + \vec{v}_N}{N} = \frac{\sum \vec{v}}{N}$$

$$\vec{v}_{av} = \frac{0}{N} \Rightarrow \vec{v}_{av} = 0$$



$\sum \vec{v} = 10 + (-10) = 0$

Root Mean Square of Speed (v_{rms}):

$$\vec{v}_{rms} = \sqrt{\bar{v}^2} \quad \text{--- (1)}$$

$$\text{or } v_{rms} = \sqrt{\frac{v_1^2 + v_2^2 + \dots + v_N^2}{N}} \quad \text{--- (2)}$$

Value of v_{rms} :

$$P = \frac{1}{3} \frac{mN}{V} \cdot \bar{v}^2 \quad \text{--- (3)}$$

by (3) $P = \frac{1}{3} \cdot \frac{mN}{V} \cdot v_{rms}^2$

m = mass of a molecule of gas
 N = Total number of gas molecules