Previous year JEE question 7

The average velocity of gas molecules is 400 m/sec. Calculate its rms velocity at the same temperature. *(2003 - 2 Marks)*

TIPS/Formulae :

$$C_{rms} = \sqrt{\frac{3RT}{M}}, \quad C_{av} = \sqrt{\frac{8RT}{\pi M}}$$

$$\frac{C_{rms}}{C_{av}} = \sqrt{\frac{3RT}{M}} \times \sqrt{\frac{\pi M}{8RT}} = \sqrt{\frac{3\pi}{8}} = 1.085$$

$$C_{rms} = 1.085 \times C_{av} = 1.085 \times 400 = \textbf{434 ms}^{-1}$$