

Please think on the following problem:

There is a cylinder with a piston filled with hydrogen. Mass of a hydrogen molecule is $3.22 \cdot 10^{-27} \text{ kg}$. At room temperature the molecules are moving randomly and collide elastically with the cylinder walls and the piston. The velocity of the hydrogen molecules at room temperature is $\sim 1.75 \text{ m/s}$. About $\sim 10^{23}$ molecules collide with the piston every second. Estimate the average force applied to the piston.