Physics 4311: Thermal Physics
28 January 2016

READING SCHEDULE: 2 February - 4 February

Tues. 2 Feb.:  L5 - Ch. 12, Sec. 12.1, 12.2

Thurs. 4 Feb. :L6 - Ch. 12, Sec. 12.6, 12.3, 12.4

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Atomic Microscope Lab Report #1 due on Tues. 2 Feb. in class.

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Problem Set #3 Due on Thur. 4 Feb.

#1  (a) Use the answer to Reif 7.17 (note: \( \text{erf}(1) = 0.843 \)) to find the fraction of molecules \( \tilde{P} \) whose x, y, and z velocity components simultaneously lie between \( -\bar{v} \) and \( +\bar{v} \), where \( \bar{v} \) is the most probable speed. (b) Do you think \( \tilde{P} \) is greater or less than the fraction of molecules \( \tilde{f} \) with speeds less than the most probable? Give a physical or geometric argument to support your answer (or calculate \( \tilde{f} \) and explain why it differs from \( \tilde{P} \)).

#2 Reif 7.19 (Use symmetry arguments and the mean value of \( v_x^2 \) to evaluate these.)

#3 (a) Reif: 7.20; (b) Reif 7.21

#4 Reif 7.25

#5 Reif 7.30 (For help, study the solution to Reif 7.29 given in Lecture Supplement 4-1.)

#6 Reif 7.31 (The limiting form of Reif’s answer has an error: 2/3 should be 3/2.)

How does your answer change if the gas molecules stick to the disk instead of being elastically reflected by it?