

Homework #2 — PHYS 603 — Spring 2007
Deadline: **Thursday, March 29, 2007, in class**

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Textbook: Gregory H. Wannier, *Statistical Physics*
Dover 1987 reprint of the 1966 edition, ISBN 0-486-65401-X

Do not forget to write your name and the homework number!

Each problem is worth 6 points.

Ch. 2 Elementary Statistical Methods in Physics

1. Problem 2.2, Divide N into M and $N - M$.

2. Problem 2.3, Random walk.

In this Problem, s is the total number of steps. Show that the probability distribution is given by the binomial formula (2.02), as explained in the Problem.

Do additional part (c): Show that in the limit $s \gg 1$, the probability distribution $p_s(m)$ becomes a Gaussian function of m . In this limit, you may treat s and m as continuous variables.

3. Problem 2.4, Virial theorem in classical mechanics.

4. Problem 2.9, Roll a die 4 times.

5. Problem 2.14, Virial theorem for an anharmonic oscillator.

6. Problem 2.18, Equation of state for a gas of photons.