Homework 1

Due date: Wednesday, February 11.

All written homeworks are due at the beginning of class on the due date. There is no provision for homework turned in late. Write your answers on plain or lined paper. Show your work for maximum (partial) credit. Be as neat as possible; if I can't read it, it's wrong. If your homework is longer than one page, please staple or paper-clip the pages together.

At the end of your homework, please write and sign the Honor Code pledge:
I have abided by the Wheaton College Honor Code in this work.

1. Assume $S = \{b, q, r\}$ and $T = \{a, \{q, r\}, b, c, p\}$.

   a) List the power set of S.   d) What is $S \cap T$?
   b) What is $|S|$?   e) What is $T - S$?
   c) What is $|T|$?   f) Is $S \subseteq T$?

2. Give the values for:

   a) $\lfloor 12 \rfloor$

   b) $\lceil 9.3 \rceil$

   c) $\lfloor -9.3 \rfloor$

3. Solve the following summation:

   $$\sum_{i=2}^{107} (2i^2 + 2i)$$

4. Derive a formula for each of the following that does not involve a summation and does not involve i or j. Simplify the result.

   a) $\sum_{i=3}^{n} 9i$

   b) $\sum_{j=4}^{k+4} (4^k + j)$

   c) $\sum_{i=0}^{n} \left(1 + \sum_{j=0}^{i} 4j\right)$

For the following, answer completely in your own words and using the proper terminology.

5. Levitin text, Section 1.3, p. 24, #4.

6. Text, Section 1.4, p. 37, #1 part a.

7. Text, Section 1.4, p. 37, #3.

8. Text, Section 1.4, p. 37, #4. For this problem, draw your own graph and show the adjacency matrix/adjacency list that represents that graph.