HOMEWORK ASSIGNMENT NO. 1

DATE: SEPTEMBER 15, 2009 DUE: SEPTEMBER 29, 2009

Your assignment should include complete sentences and explanations and not just a few equations or numbers. A solution will not receive full credit unless you explain what your answer represents and where it came from. You may discuss the homework with other students in the class, but please write your own solutions.

(1) Complete the self test of the academic integrity tutorial found online at
    `http://www.yorku.ca/tutorial/academic_integrity/`
    Print out the results and include it with this assignment.
(2) Notice that $(n+1)n - n(n-1) = 2n$. Use this to show that
$$2 \cdot 1 + 2 \cdot 2 + 2 \cdot 3 + \cdots + 2 \cdot n = (n+1)n \ .$$
Explain why this shows (at least one complete sentence)
$$1 + 2 + 3 + \cdots + n = \frac{(n+1)n}{2} \ .$$
(3) Explain how the equation $(n-1)n(n+1) - (n-2)(n-1)n = 3(n-1)n$ can be used to give an expression for
$$1 \cdot 2 + 2 \cdot 3 + 3 \cdot 4 + \cdots + (n-1)n$$
(4) Use the previous two problems to show
$$1^2 + 2^2 + 3^2 + \cdots + n^2 = \frac{n(n+1)(2n+1)}{6}$$