Homework 5

Finding a pattern

Due 3 October 2003:

1. (10 pts) Find a formula for the n-th term of the sequence whose first few terms are given.

    (a) 1, 4, 9, 16, 25, 36, 49, ...

    (b) 8, 10, 12, 14, 16, 18, ...

    (c) 3, 1, -1, -3, -5, -7, ...

    (d) 1, 2, 1, 4, 1, 6, 1, 8, ...

    (e) 0, 1, 3, 7, 15, 31, ...

2. (5 pts) Find the n-th derivative of $f(x) = 2e^{5x}$.

3. (5 pts) n circles are given in a plane, such that every pair of circles has 2 intersection points, but no 3 circles have a common point. Into how many regions do they divide the plane?

4. (5 pts) What is the last digit of 2003^{2003}?

Extra credit: Solve the Evil Puzzle "Jeanette and Giuseppe" on the next page.