HOMEWORK ASSIGNMENT NO. 5

DATE: NOVEMBER 17, 2009 DUE: DECEMBER 1, 2009

(1) The following sequence seems to have a predictable pattern. Write out the next 5 terms of how you think that the sequence continues and then give a formula for the k^{th} term in that sequence (where k is a positive integer and the first term in the sequence corresponds to $k = 1$). Make sure that you explain how you arrived at your answer and verify that it is correct.

(a)
$$7, 10, 13, 16, 19, \ldots$$

(b)
$$3, 9, 18, 30, 45, \ldots$$

(c)
$$1, 4, 10, 20, 35, 56, \ldots$$

(d)
$$8, 4, 2, 1, 1/2, \ldots$$

(e)
$$1 + 0, 2 - 1, 3 + 4, 4 - 9, 5 + 16, 6 - 25, \ldots$$

(f)
$$1, 3, 12, 60, 360, \ldots$$

(g)
$$1, 2, 1, 3, 1, \ldots$$

(h)
$$0, 1, 0, 3, 16, 45, \ldots$$

(i)
$$\frac{1}{1 \cdot 4}, \frac{2}{3 \cdot 8}, \frac{3}{5 \cdot 12}, \ldots$$

(2) Which of the following formulas describe the sequence $1, 2, 1, 3, \ldots$? Why or why not?

$$-k^2 + 4k - 2$$
$$k/4 + 1 + (-1)^k k/4$$
$$\frac{5}{6}k^3 - \frac{7}{2}k^2 + \frac{11}{3}k + 1$$
$$\frac{5}{6}k^3 - 6k^2 + \frac{79}{6}k - 7$$