Math 253N ASSIGNMENT 15 **Due at the start of class Friday, May 19th**

Do all work on additional paper.

1. Consider the series $7 - 14(x+1) + 28(x+1)^2 - 56(x+1)^3 + 112(x+1)^4 - \cdots$

   (a) The series is geometric - give the ratio r.

   (b) Where is the series centered? Determine the radius of convergence and interval of convergence - label them so that I know what is what! You may use the abbreviations ROC and IOC.

   (c) Give the summation form of the series.

   (d) To what function $f(x)$ does the series converge in the interval of convergence? Graph both the function and several terms of the series to check your answer.

2. **Algebraically** determine the Mclaurin series for the function $g(x) = \dfrac{5}{3x-1}$ and the interval in which the series converges to the function.

3. Find a series solution for the differential equation $y' + 3y = 0$.

4. **Algebraically** determine the Taylor series centered at $c = 2$ for $h(x) = \dfrac{3}{7-x}$ and the interval in which the series converges to the function.

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