HOMEWORK #7 (Chapter 5 Exercises--- Solutions about Ordinary Points)

**Due on Nov. 30**

1) Rewrite the given expression as a single power series

$\sum_{n=1}^{\infty} 2nc_n x^{n-1} + \sum_{n=0}^{\infty} 6c_n x^{n+1}$ (page 246, Problem 9)

2) Verify by direct substitution that the given power series is a particular solution of the indicated differential equations.

$y = \sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{n} x^n$ $(x+1)y'' + y' = 0$ (page 246, Problem 11)

3) Find two power series solutions of the given differential equation about the ordinary point $x = 0$

$y'' - 2xy' + y = 0$ (page 246, Problem 15)

4) Find two power series solutions of the given differential equation about the ordinary point $x = 0$

$(x-1)y'' + y' = 0$ (page 246, Problem 19)

5) Use the power series method to solve the given initial-value problem.

$(x-1)y'' - xy' + y = 0,\ \ y(0) = -2,\ \ y'(0) = 6$ (page 246, Problem 25)

6) Use the power series method to solve the given initial-value problem.

$y'' - 2xy' + 8y = 0,\ \ y(0) = 3,\ \ y'(0) = 0$ (page 246, Problem 27)