1. Given the differential equation $y'' - 2xy' + y = 0$, assume the solution can be written in the form of the series, and find the recurrence relation for the coefficients. Then find the first three non-zero terms of two independent solutions (y_1 and y_2).

2. Find the radius of convergence of $\sum_{n=1}^{\infty} \frac{(-1)^n n^2 (x+2)^n}{3^n}$, and an open interval where the series will converge absolutely. (Do not worry about the endpoints of the interval.)