No Calculators, closed book, no lecture notes, no homework. Show steps.

1. Show that \( y = \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!} \) is a solution to the differential equation: \( y'' + y = 0 \)

2. Calculate the radius of convergence and interval of convergence for \( \sum_{n=1}^{\infty} \frac{(x-10)^n}{n^4n^{-1}} \)