HOMEWORK # 10, written assignment

(a) Find the radius of convergence R of the power series

$$\sum_{n=0}^{\infty} \frac{(-1)^n x^{2n+1}}{(2n+1)!}.$$

(b) Show that the function

$$f(x) = \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n+1}}{(2n+1)!}, \quad -R < x < R$$

is a solution of the differential equation

$$y'' + y = 0.$$

(c) Solve the initial value problem

$$y'' + y = 0, \quad y(0) = f(0), \quad y'(0) = f'(0).$$

in order to determine what familiar function f is.