8. [12 points] Let

$$\sum_{n=0}^{\infty} \frac{(-1)^n}{4^n(n+1)}(x+1)^{2n}$$

a. [3 points] At $x = -3$, does the series converge absolutely, conditionally or diverge?

b. [2 points] Using just your answer in (a), state the possible values for the radius of convergence R could be. Justify.

c. [7 points] Find the interval of convergence of the series

$$\sum_{n=0}^{\infty} \frac{(-1)^n}{4^n(n+1)}(x+1)^{2n}$$