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