FOR $\sum_{n=0}^{\infty} \frac{n+1}{2^n n!} x^n$ FIND INTERVAL & RADIUS OF CONVERGENCE.

USE THE RATIO TEST.

$$\lim_{n\to\infty} \left| \frac{(n+2)x^{n+1}}{2^{n+1}(n+1)!} \cdot \frac{2^n n!}{(n+1)x^n} \right| = \lim_{n\to\infty} \left| \frac{(n+2)\, n! \cdot 2^n x^{n+1}}{(n+1)(n+1)\, n!\, 2^{n+1} x^n} \right|$$

$$= \lim_{n\to\infty} \left| \frac{(n+2)}{(n+1)(n+1)} x \right| = 0$$

SINCE THE RATIO IS 0, THE RADIUS OF CONVERGENCE IS ∞

AND THE INTERVAL OF CONVERGENCE IS

$$-\infty < x < \infty$$