5. [9 points] The radius of convergence of the power series below is 4. Find the **interval of convergence**.

$$\sum_{n=1}^{\infty} \frac{5n}{4^n(n^2+1)}(x+1)^n.$$

Show all your work including full justifications of convergence and divergence of any relevant series. Throughout this problem, you may assume that the radius of convergence is 4 and you do not need to recompute it.

The interval of convergence is _____.