Math 121   Take-Home Quiz #6

Due Sunday, November 12, 2023 in Gradescope by 11:59 pm ET

Instructions:

• This is an Open Notes Quiz. You can use materials, homeworks problems, lecture notes, etc. that you manually worked on.

• This is **NOT** an Open Internet Quiz. You can only access our Main Course Webpage.

• You are not allowed to work on or discuss these problems with other students or people.

• You can ask a few small, clarifying, questions in Office Hours, but the problems will not be solved for you.

• The main goal is to make a thoughtful and detailed presentation for the solutions. Submit a clear final draft. No mess please.

• Please submit your final work in Gradescope in the Quiz 6 entry.

Find the **Interval and Radius of Convergence** for each of the following power series. Analyze carefully and with full justification. Pay careful attention to the language used to justify the Ratio Test conclusion. There is a Handout posted on the webpage that can help you. [10 Points each]

1. $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^n \ (3x+1)^n}{(n+7) \ 7^n}$

2. $\displaystyle\sum_{n=2}^{\infty} n^n \ (\ln n) \ (x-6)^n$

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

Optional Bonus: Create a Power Series with Interval of Convergence $I = \left[-\frac{3}{2}, \frac{4}{5}\right)$. Continue on to justify that your series satisifies this challenge.