Math 121 Take-Home Quiz #4

Due Sunday, April 25, 2021 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 4 entry.

1. [30 Points, 10 Points each] Find the Interval and Radius of Convergence for each of the following power series. Analyze carefully and with full justification.

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

(b) $\displaystyle\sum_{n=1}^{\infty} n^n (x-6)^n$

(c) $\displaystyle\sum_{n=1}^{\infty} \frac{x^{2n+1}}{n!}$

2. [10 Points] You do **not** need to find the Radius of Convergence. Justify all details.

(a) Find the MacLaurin Series Representation for the Hyperbolic Cosine $f(x) = \cosh x$, using the Definition of a MacLaurin Series. (That is, Chart Method)

(Just for fun, optional) Demonstrate a second, different method/approach from part (a) above, to compute the MacLaurin Series for the same function, $f(x) = \cosh x$.

(Just for fun, optional) Demonstrate a third, different method/approach from parts (a) and (b) above, to compute the MacLaurin Series for the same function, $f(x) = \cosh x$.