Name: _____

- This packet is due at **5:00 pm PDT on Wednesday, May 5**.
- Neatly fill out this packet either directly or on your own paper. Then upload your answers to Canvas. Please clearly number each problem and keep them in order.
- For each problem in this packet, **organize and show all of your work and justification** for your answer.
- Make sure that it is clear what your final answer is. This may mean boxing/circling it or it may mean doing neither.
- If you are required to draw a graph of a function, each axis must be labeled and given a scale.
- I will not be grading every individual problem, but answers will be available on Canvas after the due date.
- I am happy to help you however I can. Here are some options:
  - Come to my office hours (see syllabus).
  - Email me directly at gknapp4@uoregon.edu

1. Use the ratio test to determine whether $\sum_{n=1}^{\infty} a_n$ converges, where a_n is given in the following problems. State if the ratio test is inconclusive.

   (a) $a_n = \dfrac{7^n}{n!}$

   (b) $a_n = \dfrac{n^7}{(-3)^n}$

(c) $a_n = \dfrac{(2n)!}{n^2}$

(d) $a_n = \dfrac{2^{5n}(n!)^3}{(3n)!}$

2. Use the root test to determine whether $\sum_{n=1}^{\infty} a_n$ converges where a_n is as follows.

(a) $a_n = \dfrac{(-2)^n}{n}$

(b) $a_k = \dfrac{k^e}{e^k}$

(c) $a_k = \dfrac{1}{(1+\ln k)^k}$

(d) $a_n = \dfrac{(\ln(1+\ln n))^n}{(\ln n)^n}$