

Main Exercises Week 14

MATH 131: Calculus II, Section 2

Your Name (Print): _____

Follow the general guidelines for the Main Exercises assignments (the salmon colored handout). Be sure to **staple** together your pages if you have more than one, and include your **name** at the top. Neatness is appreciated, makes a good first impression, and can earn you a bonus point!!!

Due: at the beginning of class on Wednesday, December 5, 2018

Remember: Your write-up should be **your own**. You may discuss these problems with others, but **you should be alone when you write them up**, using only outlines of any group or Intern discussions. **EXPLAIN and SHOW YOUR WORK!!!** Final answers will not receive full credit without supportive explanations. You may use your own paper on which to write these up.

BEWARE! The first question is about sequences and the others are about series. Remember how these are similar and how they are different!!! Also remember that solutions should all contain at least one full sentence and use names of series or tests where appropriate!

1. Determine whether the following sequence is convergent or divergent. If the sequence converges, find the limit. Be sure to show work to support your answers.

$$\left\{ \ln \left(\frac{n^2 + 1}{3n^2 - 5n} \right) \right\}$$

2. Using your work from the first question, determine if the **series** $\sum_{n=2}^{\infty} \ln \left(\frac{n^2 + 1}{3n^2 - 5n} \right)$ is convergent or divergent. Be sure to show detailed work; explain all steps.

3. Determine whether the following series is convergent or divergent. If the series is convergent, find the sum (if possible!). If it is divergent, explain why.

$$\sum_{n=1}^{\infty} \frac{e^n}{3^{n-1}}$$

4. Determine whether the following series is convergent or divergent. If the series is convergent, find the sum (if possible!). If it is divergent, explain why.

$$\sum_{n=1}^{\infty} \frac{5^n \cdot n^2}{n!}$$