

Math 1080: Calculus of One Variable II  
**Written Homework 5 (20 points)**  
(Sections 10.1 - 10.3, 10.4, part 1)  
**Due in Canvas by 11:59 pm on Friday, Oct. 9**

Do the problems below. You are allowed to discuss these problems with your classmates, but the work you hand in must be your own. Remember to:

- Write your **name** on your homework.
- Write neatly, show all work, use proper mathematical notation, and organize your work clearly. If the grader cannot follow your work or certain steps are missing or not justified, you may not receive full credit.
  - Note: It may take you a few tries to figure out the method of solution on a problem. Work through the problem on scratch paper first, then re-write your final solution that you will turn in. This will help in clearly organizing your work and will reinforce the concepts involved in the solution.

**Submit your written homework in Canvas:** You will submit a pdf file of your homework in Canvas. Go to Written Homework 5 in Canvas and upload the pdf file of your homework solutions. Then click submit assignment. Remember that it is your responsibility to make sure that your scanned work is readable. If the scan is poor quality and cannot be read by the grader, you may not receive credit for your work. After the homework is graded, you will be able to see your grade and any comments on your homework in Canvas.

Note: In problems on determining series convergence or divergence, **include:**

- **The name of the convergence test or the definition used,**
- **work to show that the test conditions have been met or work to apply the definition,**
- **and a conclusion statement about convergence or divergence.**

1. (4 points) Determine whether the series is convergent or divergent. If it is convergent, find its

sum.  
$$\sum_{k=1}^{\infty} \left( \frac{1}{\sqrt{k+1}} - \frac{1}{\sqrt{k+3}} \right)$$

2. (a) (3 points) Determine whether the sequence given by  $a_k = \sqrt{\frac{4k+3}{16k+1}}$  converges or diverges. If it converges, find the limit.

- (b) (4 points) Determine whether the series  $\sum_{k=1}^{\infty} \sqrt{\frac{4k+3}{16k+1}}$  is convergent or divergent. If it is convergent, find its sum.

3. (4 points) Determine whether the series is convergent or divergent. If it is convergent, find its sum.

$$\sum_{k=0}^{\infty} \left( \frac{1}{4} \right)^k 3^{2-k}$$

4. (5 points) Use the Integral Test to determine whether the series  $\sum_{k=1}^{\infty} \frac{1}{\sqrt[3]{3k+5}}$  is convergent or divergent. Remember to include work checking the conditions for the Integral Test