

Mathematics 1120H – Calculus II: Integrals and Series

TRENT UNIVERSITY, Summer 2021 (S62)

Quiz #5

Wednesday, 21 July.

Available on Blackboard at 12:00 a.m. Wednesday morning.

Due on Blackboard by 11:59 p.m. Wednesday night.

Solutions will be posted on Friday, 23 July.

Submission: Scanned or photographed solutions are fine, so long as they are legible. Please try to make sure that they are oriented correctly – if they are sideways or upside down, they're rather harder to mark! Submission as a single pdf is strongly preferred, but multiple files and/or other common formats are probably OK in a pinch. Please submit your solutions via Blackboard's Assignments module; if Blackboard does not acknowledge a successful upload, please try again. As a *last* resort, email your solutions to the instructor at: `sbilaniuk@trentu.ca`

Reminder: Per the course outline, *all work submitted for credit must be written up entirely by yourself, giving due credit to all relevant sources of help and information.* For this and other quizzes, unless stated otherwise, you are permitted to use your textbook and all other course materials, from this and any other mathematics course(s) you have taken or are taking now, but *you may not use any other sources or aids, nor give or receive any help*, except to ask the instructor to clarify questions and to use a calculator (any that you like) to help with your arithmetic and to evaluate functions.

Do all of the following questions. Show all your reasoning in each solution. Please note that part marks are available in questions worth more than 0.5 points, so incomplete or incorrect solutions may still earn something.

1. Determine whether the series $\sum_{n=0}^{\infty} \frac{(-1)^n n}{3^n}$ converges absolutely, converges conditionally, or diverges. [1]
2. Consider the series $\sum_{n=0}^{\infty} \frac{2}{(n+2)(n+4)}$.
 - a. Verify that this series converges. [1]
 - b. Find the sum of this series. [1]
3. Determine whether the series $\sum_{n=1}^{\infty} \frac{\ln(n)}{n^2}$ converges or diverges. [2]

[Total = 5]