

Mathematics 1120H – Calculus II: Integrals and Series

TRENT UNIVERSITY, Summer 2020

Quiz #6

Tuesday, 28 July.

Available on Blackboard from 12:01 a.m. on Tuesday, 28 July.

Due on Blackboard by 11:59 p.m. on Tuesday, 28 July.

Solutions will be posted on Thursday, 30 July.

Scans of photos of handwritten work are entirely acceptable so long as they are legible and in some common format; solutions submitted as a single pdf are preferred, if you can manage it. If you can't submit your solutions via Blackboard's Assignments module for some reason, please email them 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 the quizzes, you are permitted to use your textbook and all other course material, 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).

We know from lecture that the Taylor series at 0 (otherwise known as the MacLaurin series) of $\cos(x)$ is

$$\sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!}.$$

1. As was done in the lecture for $\cos(x)$, use Taylor's formula to find the Taylor series at 0 of $\sin(x)$ and determine its interval of convergence. [2.5]
2. Find the Taylor series at 0 of $\sin(x)$ without (directly) using Taylor's formula. [1]
3. Find the Taylor series at 0 of $f(x) = \sin(x) + x \cos(x)$ [1.5]