

Mathematics 1110H – Calculus I: Limits, Derivatives, and Integrals (Section C)  
TRENT UNIVERSITY, Fall 2021

Quiz #7

Wednesday, 10 November.

Available on Blackboard at 12:00 a.m. Wednesday morning (Eastern Time).

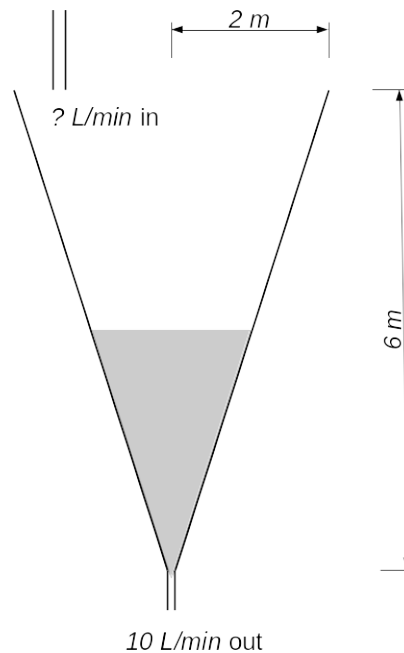
Due on Blackboard by 11:59 p.m. Wednesday night (Eastern Time).

Solutions will be posted on Saturday, 13 November.

**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. If uploading to Blackboard fails repeatedly, please email your solutions to the instructor at: [sbilaniuk@trentu.ca](mailto: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 the following problem.



1. A conical tank 6 m tall and with a radius of 2 m at the blunt end is oriented point down and blunt end up. A pipe feeds water into the tank at the top at an unknown constant rate, while another pipe at the tip of the tank removes water from the tank at a rate of 10 L/min. Suppose the water level in the tank is rising at a rate of 20 cm when the depth of the water in the tank is 2 m. Find the rate at which water is being fed into the tank. [5]

[Total = 5]