

Mathematics 1110H – Calculus I: Limits, derivatives, and Integrals

TRENT UNIVERSITY, Fall 2020

Quiz #8

Tuesday, 17 November .

Available on Blackboard from 12:00 a.m. on Tuesday, 17 November.

Due on Blackboard by 11:59 p.m. on Tuesday, 17 November.

Solutions will be posted on Thursday, 19 November.

Scans or 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 on time 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 this quiz, you are permitted to use your textbook and all other course material, 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).

1. A lever 30 cm long is in the middle of a horizontal table, with its hinge built into the surface of the table and with large ceiling lighting panel directly above the lever. The lever is pulled down from a vertical position to a horizontal position in such a way that the angle it makes with the vertical changes at a constant rate of $\pi/6$ rad/min. The lever casts a shadow on the surface of the table in the light from the panel. How is the length of this shadow changing at the instant that the angle the lever makes with the vertical is $\pi/3$ rad? [5]