

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

TRENT UNIVERSITY, Fall 2020

Quiz #9

Tuesday, 24 November .

Available on Blackboard from 12:00 a.m. on Tuesday, 24 November.

Due on Blackboard by 11:59 p.m. on Tuesday, 24 November.

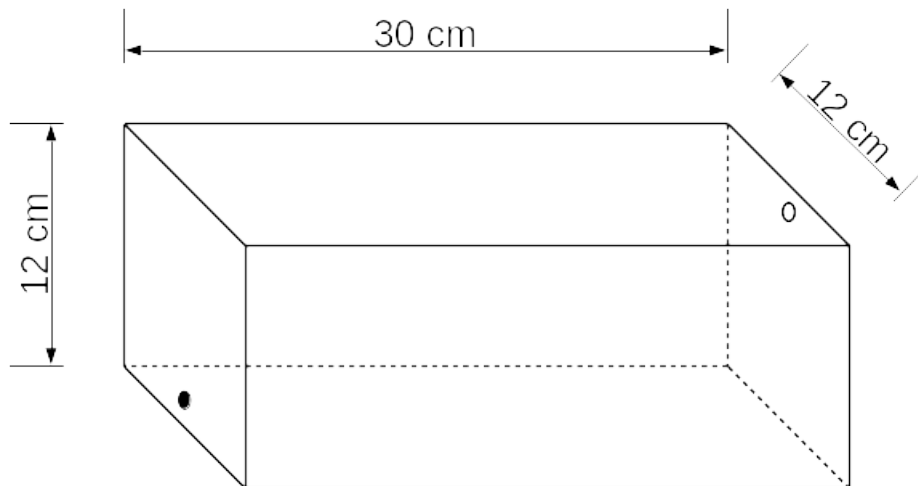
Solutions will be posted on Thursday, 26 November.

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).

The Escape of the Ant

A box with dimensions 12 cm by 12 cm by 30 cm is sitting on a desk, with the bottom being one of the 12 cm by 30 cm faces. The box has a small hole in one of the 12 cm by 12 cm faces, with the hole being in the middle 1 cm below the top of that face. An ant is inside the box, initially in the middle of the other 12 cm by 12 cm face, 1 cm above the bottom of that face. The ant wants to leave the box by the shortest path it can, but it can only move on the faces of the box. (No jumping, no flying, no teleportation ... :-)



1. What is the length of the shortest path along the sides and/or top and/or bottom of the given box from the initial position of the ant to the hole? [5]