

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

Quiz #7

A puzzling change of pace!

Wednesday, 17 November.

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

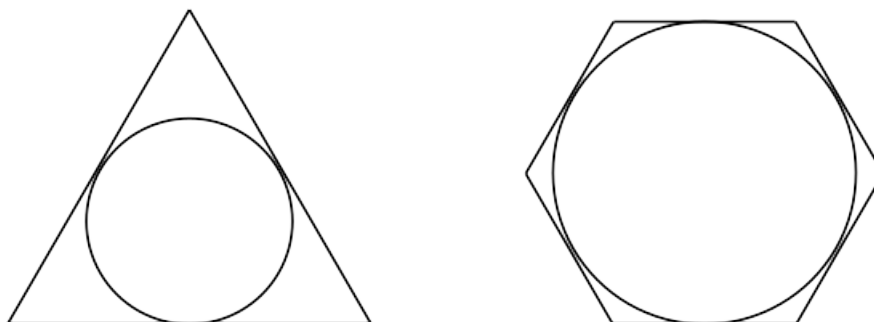
Due on Blackboard by 11:59 p.m. Wednesday night (Eastern Time).

Solutions will be posted on Saturday, 20 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.

1. Suppose one is given twelve line segments of equal length, of which six are used to make an equilateral triangle and six are used to make a regular hexagon. Circles are inscribed inside each polygon, touching each side of its respective polygon at the midpoint only, as in the diagram below.



Find the ratio of the area of the circle inscribed in the triangle to the area of the circle inscribed in the hexagon. [10]

NOTE: This can be done without using calculus, or even trigonometry, though you are welcome to use any and all mathematical tools you wish.