

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

TRENT UNIVERSITY, Fall 2020

Assignment #3

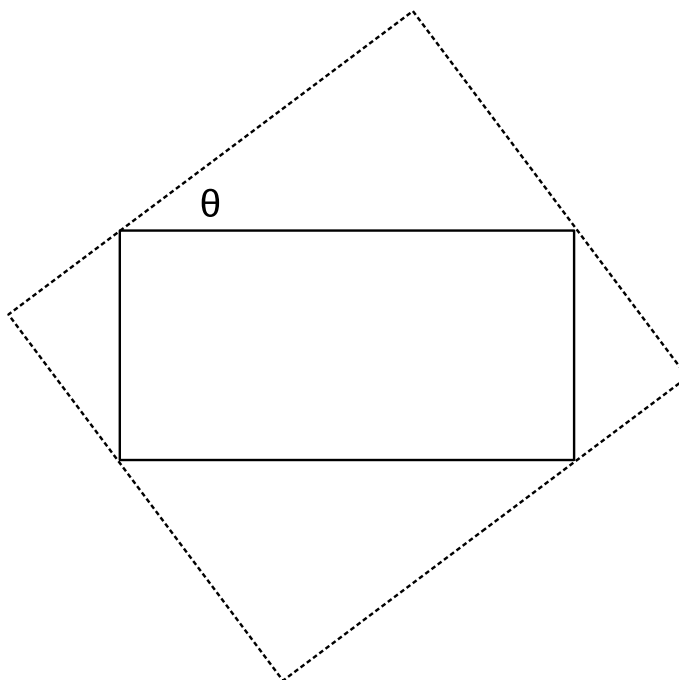
Rectangles Within/Without

Due on Friday, 23 October.

Submission: Scanned or photographed handwritten solutions are fine, so long as they are legible. Submission as a single pdf is strongly preferred, but other common formats are probably OK. (If not, we'll get back to you! :-) Please submit your solutions via Blackboard's Assignments module. If that fails, please email your solutions to the instructor at: sbilaniuk@trentu.ca

Rectangle A is *circumscribed* about rectangle B (and B is *inscribed* in A) if B is inside A and the corners of B touch the borders of A .

1. Suppose we are given a rectangle of height 1 and width 2. What is the maximum possible area of a rectangle circumscribed about the given one, as in the diagram below? [10]



Hint: Express the lengths of the sides of the circumscribed rectangle in terms of the angle θ between its sides and the sides of the given rectangle.