Mathematics 1120H – Calculus II: Integrals and Series

TRENT UNIVERSITY, Winter 2020

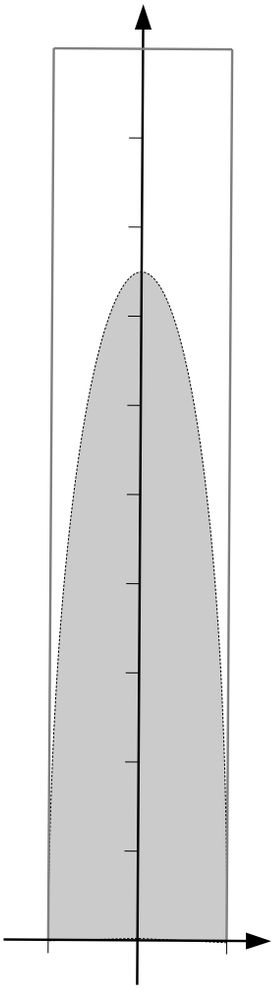
Assignment #1

Half a rectangle, half a rectangle, by a parabola onward!

Due on Friday, 26 June.

Please submit your solutions using Blackboard's assignment module. If that fails, please email your solutions to the instructor (`sbilaniuk@trentu.ca`*). Scans or photos of handwritten solutions are perfectly acceptable, so long as they are legible and in some common format. (Combined into a single pdf, for preference.)*

Consider the rectangle in the Cartesian plane with corners at $(-1, 0)$, $(1, 0)$, $(1, 10)$, and $(-1, 10)$.



1. Find the equation of the parabola opening downwards that has x-intercepts at -1 and 1 and such that the part of the parabola inside the given rectangle cuts off half the area of the rectangle. *[5]*
2. Find the equation of another parabola, this one opening upwards and passing through $(1, 10)$ and $(-1, 10)$, such that the finite region above this parabola and below the parabola from question bf 1 has one quarter of the area of the rectangle. *[5]*