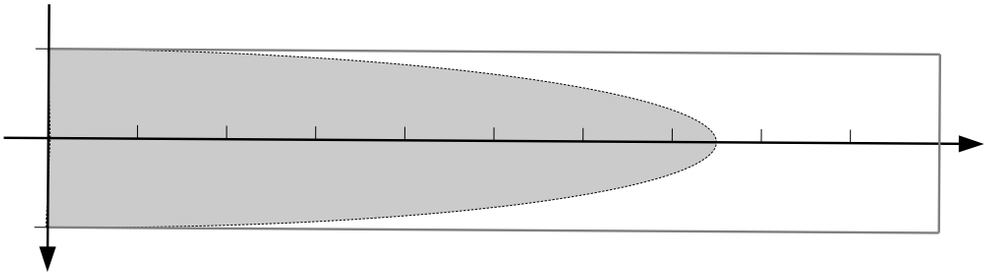
Mathematics 1110H – Calculus I: Limits, Derivatives, and Integrals
TRENT UNIVERSITY, Fall 2018

Assignment #10
Half a rectangle, half a rectangle by a parabola onward!
Due on Friday, 30 November.

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]*