Latin Modern Math

Calculus II: Project 1

Due on April 7, 2017

Adrian Ulises Soto

Sergio Ugalde Marcano **Davis Josh**
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Problem 1

Choose a profile picture, which can be scanned from a drawing or desinged entirely on a computer. Each drawing must be unique and must be approved before proceeding to continue the project. The drawing must have an axis of symmetry. The design must be such that an application of Simpson's rule can be used to approximate the several integrals. Pixelated desings are also possible. The boundary must be a simple closed curve with (no holes, no self-crossing).

Problem 2

Choose a particular scale, origin and coordinate axes for your drawing.

Problem 3

Numerically, and an approximation to the area of your drawing using Simpson's rule and the Trapezoidal rule. If your drawing allows it, and an exact answer also.

Problem 4

Numerically, and an approximation of the perimeter of your drawing approximating it using straight lines and adding the length.

Problem 5

Choose an axis parallel to the axis of symmetry of your gure on which you will revolve your figure to produce a life saver with your figure as profile

Problem 6

Investigate Pappus' Theorem for solids of Revolution, and use it to

a) Compute the volume of the resulting solid of revolution.

b) Compute the surface area of the resulting solid of revolution

Problem 7

Investigate Arquimedes' Theorem to And the boyance force of the life saver assuming it is completely submerged in water, and is filled with air.

Problem 8

Using Simpson's rule, and the volume of the solid of revolution without using Pappus' Theorem.

Problem 9

Make a real design of your life saver. You may 3d print it if you wish.