EXAM 2 - MATH 152 Friday, February 24

YOUR NAME:_____ George Voutsadakis

Read each problem **very carefully** before starting to solve it. Each problem is worth 10 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Find the volume of the solid obtained by rotating the region bounded by the curves $y = x^2$ and $x = y^2$ about the line $x = -1$.

2. Find the volume of the solid generated by rotating the region bounded by the curves $y = e^{-x^2}$, $y = 0$, $x = 0$ and $x = 1$ about the $y$-axis.

3. Calculate the length of the curve $x = \frac{1}{3}\sqrt{y}(y-3)$, $1 \leq y \leq 9$.

4. A water tank has the shape of the bottom half of a hemisphere with radius 5 feet. If it is full of water that weighs 62.5 lb/ft$^3$, find the work required to pump the water out of the tank (from the top).

5. Find the solution of the differential equation $\frac{dy}{dx} = \frac{y \cos x}{1+y^2}$, that satisfies the initial condition $y(0) = 1$.