York University, Department of Mathematics and Statistics
Math 1014 "Applied Calculus II", Winter 2015
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Test 1

2015-2-2

Last name .....

First name .....

Student ID .....

Email .....

Section number .....

Instructions

(a) Solve each of the 4 questions.

(b) Write legibly. Clearly indicate where you are writing your solutions.

1. (10 pts)
Evaluate the following integrals:

(a) $\int_0^4 (x^2+1)e^{-x}dx$ (b) $\int \frac{x^3}{\sqrt{4-x^2}}dx$

Extra space for Question 1

2. (10 pts)
Find the volume of the solid obtained by rotating the region bounded by the curves $y = x$ and $y = x^2$ about the line $y = 2$.

Extra space for Question 2

3. (10 pts)

(a) Find the number(s) a such that the average value of the function $f(t) = 25 - 20t + 3t^2$ on the interval $[0, a]$ is equal to 4.

(b) Find the area of the region bounded by the curves $y = x^2 - 2x$ and $y = x + 4$. Include a sketch of the area involved.

Extra space for Question 3

4. (10 pts)

A TTC subway train starting from rest at one station accelerates towards a maximum speed V_f so that after t seconds its speed is $V_f(1 - e^{-at})$.

a) How far will it have travelled in T seconds? [Express your answer in terms of V_f, T and a].

b) If $V_f = 15$m/s and $a = 0.01$/s how far will it have travelled in 100s. [You can assume that $1/e = 0.37$]

Extra space for Question 4

Extra space