

Suffolk County Community College
Michael J. Grant Campus
Department of Mathematics

Spring 2011

MAT 142
Calculus with Analytic Geometry II

Final Exam

Instructor:

Name: Alexander Kasiukov

Office: Suffolk Federal Credit Union Arena, Room A-109

Phone: (631) 851-6484

Email: kasiuka@sunysuffolk.edu

Web Site: <http://kasiukov.com>

Please print the requested information in the spaces provided:

Student:

Name:

Student Id:

Email:

include to receive the final grade via email ONLY if you are not getting email updates

- *Notes and books are permitted on this exam.*
- *Graphing calculators, smartwatches, computers, cell phones and any other communication-capable devices are prohibited. Their mere presence in the open (even without use) is a sufficient reason for an immediate dismissal from this exam with a failing grade.*
- *You will not receive full credit if there is no work shown, even if you have the right answer. Please don't attach additional pieces of paper: if you run out of space, please ask for another blank final.*

Problem 1. Compute the integral

$$\int x \cos(6x^2 - 1) \, dx.$$

Space for your solution:

Problem 2. Compute the integral

$$\int e^{\sqrt{x}} \, dx.$$

Space for your solution:

Problem 3. Find the limit

$$\lim_{x \rightarrow 0} \frac{(\tan x) - x}{(\sin x) - x}.$$

Space for your solution:

Problem 4. Compute the integral

$$\int \frac{x^3 - 8x^2 + 21x - 19}{x^2 - 6x + 9} dx.$$

Space for your solution:

Problem 5. Consider the function $f(x) = \sqrt[3]{x}$.

(1). Which point (or points) from the domain of the function f would be a good choice for the center of a Taylor polynomial for f and why?

Space for your solution:

(2). Compute the Taylor polynomial of degree 5 for the function f at one of the points you found in part (1).

Space for your solution:

(3). Determine the Taylor series of the function f .

Space for your solution:

(4). Find the radius of convergence of the series you found in part (3).

Space for your solution:

(5). Give an estimate of the error term of the Taylor polynomial of the function f within the interval of convergence. The estimate must be computable by arithmetic operations only and must go to zero as the degree of the Taylor polynomial goes to infinity.

Space for your solution:

(6). Propose a method for finding the values of f at the points outside of the interval of convergence.

Space for your solution: