

Math 211

Exam 3

Dr. Chandarana

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Name:

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Discussion Section Time

Note: For full credit show all work and proper reasoning clearly. There will be very little or no credit for answers given without showing work. Incorrect reasoning may count against you. You are expected to give *exact* answers. No calculators are allowed on this exam. *After you finish writing the exam hand it to your TA along with the "cheat sheet".*

There are seven (7) pages (including this page) on this exam and an extra sheet for scratch work. Do not miss any pages by mistake.

Good Luck!

<i>problem</i>	<i>points</i>	<i>your score</i>
1	16	
2	18	
3	16	
4	18	
5	18	
6	14	
<i>total</i>	100	

1. (16 points) Find the area between the graphs of $f(x) = x^2$ and $g(x) = \sqrt{x}$ over the interval $[0, 4]$.

2. (18 points) Solve the initial value problem

$$\frac{dA}{dt} = 0.2A + 300, \quad A(0) = 75.$$

3. (16 points) You deposit \$5000 on January 1, 2006 into a savings account, and then also deposit \$1500 per year continuously into the same savings account that pays 7% interest per year compounded continuously. How much money will you have in the account at the end of 25 years (assuming that you make no withdrawals)? *Give an exact answer.*

4. (18 points) Determine if the improper integral converges. If it converges, compute it and give an exact answer.

(a) $I = \int_2^{\sqrt{7}} (t-2)^{-\frac{4}{3}} dt.$

(b) $J = \int_5^{\infty} ye^{-y} dy.$

5. (18 points) Find all points (x, y) where the function

$$f(x, y) = x^2 + 2y^2 - xy - 7x + 1$$

has its local minima, local maxima and saddle points, if any. Then find these local minimum and local maximum values, if any.

6. (14 points) Find the equation of the tangent plane to the graph of the function

$$f(x, y) = x^3 - 3y^2 - xy - 5$$

at the point $(-1, 1)$. *DO NOT simplify the equation that you find.*

Scratch Work