

Math 126 - Spring 2014  
Exam 2  
Tuesday, May 20, 2014

Name: \_\_\_\_\_

Section: \_\_\_\_\_

Student ID Number: \_\_\_\_\_

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- There are 4 pages of questions. Make sure your exam contains all these questions.
- You are allowed to use a scientific calculator (**no graphing calculators and no calculators that have calculus capabilities**) and one **hand-written** 8.5 by 11 inch page of notes.
- You must show your work on all problems. The correct answer with no supporting work may result in no credit. **Put a box around your FINAL ANSWER for each problem and cross out any work that you don't want to be graded.** Give exact answers wherever possible.
- If you need more room, use the backs of the pages and indicate to the grader that you have done so.
- Raise your hand if you have a question.
- There may be multiple versions of the exam so if you copy off a neighbor and put down the answers from another version we will know you cheated. Any student found engaging in academic misconduct will receive a score of 0 on this exam. All suspicious behavior will be reported to the student misconduct board. In such an instance, you will be force to meet in front of a board of professors to explain your actions.  
**DO NOT CHEAT OR DO ANYTHING THAT LOOKS SUSPICIOUS!**  
**WE WILL REPORT YOU AND YOU MAY BE EXPELLED!**
- You have 50 minutes to complete the exam. Budget your time wisely.  
**SPEND NO MORE THAN 10 MINUTES PER PAGE!**

GOOD LUCK!

1. (13 pts)

- (a) At time  $t = 0$  a particle is passing through the  $xy$ -plane at the location  $(0, 0, 0)$  with velocity  $\mathbf{v}(0) = \langle -1, -2, -6 \rangle$ . The acceleration of the particle is given by  $\mathbf{a}(t) = \langle \pi \sin(\pi t), 0, 4 \rangle$ . Find the speed of the particle at the next time it passes through the  $xy$ -plane. (Hint: First find the position function).

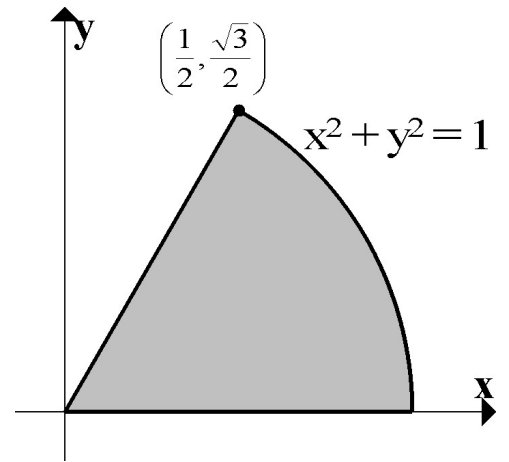
- (b) Consider the surface given implicitly by  $z^2 = e^{(x^2y^3-1)} + \frac{3x}{y} + \ln(y)$ . Find the equation for the tangent plane at  $(x, y, z) = (1, 1, -2)$ .

2. (14 pts)

(a) Reverse the order of integration and evaluate  $\int_0^3 \int_{x^2}^9 x e^{y^2} dy dx$ .

(b) Find the volume of the solid bounded by  $z = y^2$ ,  $z = 0$ ,  $y = 3x$  and  $y = 4 - x$ .

3. (9 pts) Find the average value of  $T(x, y) = 16x^2$  over the region  $D$  shown below.



4. (14 pts) Find the absolute maximum and minimum values of  $f(x, y) = y(x^2 + y^2) - 2y^2 + 1$  over the region  $D$  shown below.

