

Math 241, Exam 2, Spring, 2019

Write everything on the blank paper provided. **You should KEEP this piece of paper.** If possible: return the problems in order (use as much paper as necessary), use only one side of each piece of paper, and leave 1 square inch in the upper left hand corner for the staple. If you forget some of these requests, don't worry about it – I will still grade your exam.

The exam is worth 50 points. Each problem is worth 10 points. Please make your work coherent, complete, and correct. Please CIRCLE your answer. Please **CHECK** your answer whenever possible.

The solutions will be posted later today.

The exams will be returned on Thursday.

No Calculators, Cell phones, computers, notes, etc.

- (1) Let $f(x, y) = x\sqrt{x \cos y + 3x^2}$. Find $\frac{\partial f}{\partial x}$ and $\frac{\partial f}{\partial y}$.
- (2) Describe and graph $x^2 + y^2 - z^2 = 1$ in three-space. What is the name of this object?
- (3) Find the point of intersection of the two lines

$$\begin{cases} x = 3 - t \\ y = 3 + 2t \\ z = 10 + 5t \end{cases} \quad \text{and} \quad \begin{cases} x = 6 + s \\ y = 5 + 2s \\ z = 11 + 3s. \end{cases}$$

- (4) Find the length of the graph for $y = x^{3/2}$ on the closed interval $0 \leq x \leq 4$.
- (5) An object starts at the origin with velocity $4\vec{i} + 8\vec{j}$. The acceleration of the object at time t is $\vec{r}''(t) = 2e^t\vec{i} + 16e^{2t}\vec{j}$. What is the x -coordinate of the object when the y -coordinate is 12?