

Math 126 A - Spring 2019  
Midterm Exam Number Two  
May 21, 2019

Name: \_\_\_\_\_ Student ID no. : \_\_\_\_\_

Signature: \_\_\_\_\_

1	10	
2	10	
3	10	
4	10	
5	10	
Total	50	

- This exam consists of **five** problems on **four** double-sided pages.
- Show all work for full credit.
- You may use a TI-30X IIS calculator during this exam. Other calculators and electronic devices are not permitted.
- You do not need to simplify your answers.
- If you use a trial-and-error or guess-and-check method when a more rigorous method is available, you will not receive full credit.
- Draw a box around your final answer to each problem.
- **Do not write within 1 centimeter of the edge!** Your exam will be scanned for grading.
- If you run out of room, write on the back of the first or last page and indicate that you have done so. If you still need more room, raise your hand and ask for an extra page.
- You may use one hand-written double-sided 8.5" by 11" page of notes.
- You have 50 minutes to complete the exam.

1. **[10 points]** Let  $f(x, y) = \cos x + \cos y$ . Find all the critical points  $(x, y)$  of  $f$  with

$$-\pi/2 \leq x \leq \pi/2 \text{ and } -\pi/2 \leq y \leq \pi/2$$

and classify them (*local max*, *local min*, or *saddle point*) using the second derivative test.

2. **[10 points]** Find the critical points of the function  $f(x, y) = x^4 + y^4 - 4xy$  and classify them (*local max, local min, or saddle point*) using the second derivative test.

3. [10 points] Compute the double integral

$$\int_R xy e^{xy^2} dA$$

where  $R = [0, 1] \times [0, 2]$  is the rectangle  $\{(x, y) : 0 \leq x \leq 1, 0 \leq y \leq 2\}$ .

4. **[10 points]** Compute the volume of the solid above the  $xy$ -plane, below the parabaloid  $z = x^2 + y^2$ , and inside the cylinder  $x^2 + y^2 = 1$ .

5. **[10 points]** Find the absolute minima and maxima of the function  $x^2 - y^2$  on the region  $R = \{x^2 + y^2 \leq 1\}$ .