

Math 126, Section A, Spring 2018, Midterm II

May 17, 2018

Name _____

TA/Section _____

Instructions.

- There are 4 questions. The exam is out of 40 points.
- You are allowed to use one page of notes written only on one side of the sheet in your own handwriting. **Hand in your notes with your exam paper.**
- You may use a TI 30X IIS calculator. Give simplified exact answers unless told otherwise. For example, $\frac{2\ln 3}{\pi}$ is exact, but 0.7, 0.70, 0.6994 are approximations for the same number.
- **Show your work.** If I cannot read or follow your work, I cannot grade it. You may not get full credit for a right answer if your answer is not justified by your work. If you continue at the back of a page, make a note for me. Please BOX your final answer.

Question	points
1	
2	
3	
4	
Total	

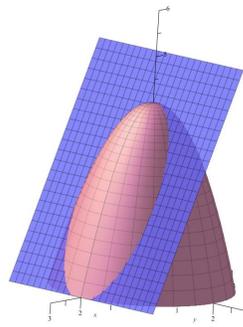
1. (8 points) Set up an integral in **polar** coordinates to find the volume of the solid under the paraboloid

$$z = 4 - x^2 - y^2$$

and above the plane

$$z = 4 - 2x.$$

A graph is given on the right to help you. Do **not** evaluate the integral.



2. (10 points) Evaluate the integral

$$\int_0^3 \int_{x/3}^1 x^2 \sqrt{3+y^2} dy dx$$

by switching the order of integration. Simplify your answer.

3. (13 points) Find the absolute maximum and absolute minimum values of the function

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

on the closed and bounded domain $x \geq 0$, $y \geq 0$ and $x + y \leq 1$. You may round your answers to two digits after the decimal.

4. Let

$$f(x, y) = \sin(xy - 1).$$

(a) (5 points) Compute all first and second partial derivatives for $f(x, y)$.

(b) (4 points) Use linear approximation at $(1, 1)$ to estimate $f(1.1, 1.2)$.