

# Math 253A Midterm 2

April 2, 2020

- Write your solutions on separate sheets of paper and upload them on Gradescope, just like your homework assignments.
- Only use the resources allowed on the exam honor code certification form.
- Be sure to include the exam honor code certification form with your solutions. If you are unable to print it, copy the form by hand.
- Show enough work that your solution would convince a skeptical peer that your answer is correct.
- The questions are ordered by topic, not by difficulty.
- Each question is worth the same number of points.

1. Determine the set of points where the function

$$f(x, y) = \frac{1}{1 - x^2 - y^2}$$

is discontinuous. Draw and/or describe this set. Be specific.

2. Find the absolute maximum and minimum values of  $f(x, y) = xy^2$  on the domain

$$D = \{(x, y) \mid x \geq 0, y \geq 0, x^2 + y^2 \leq 3\}.$$

3. Let

$$f(x, y) = \ln(3x - y).$$

Find the second-degree Taylor polynomial of  $f$  at  $(1, 2)$ .

4. (a) Compute

$$\int_0^2 y\sqrt{x+2} \, dx.$$

- (b) Compute

$$\int_0^3 y\sqrt{x+2} \, dy.$$