

Matlab Assignment 2, due Friday, March 16

In order to receive full credit you must provide me with printed copies of your output with your answers clearly indicated. You also need to answer all questions. These can either be printed along with your Matlab output, or attached on a separate printed or handwritten page. As for the first assignment, you may work in groups of two or three, but no more.

Problem 1. Let $f(x, y) = 2 - 4x^2 + 5y^2$.

- (a) Use Matlab to graph $z = f(x, y)$ near $(0, 0)$. Use both mesh and contour to examine the behavior of f near $(0, 0)$.
- (b) Based on your graph, does $\lim_{(x,y) \rightarrow (0,0)} f(x, y)$ exist? Explain your answer.
- (c) Based on your graph, does $z = f(x, y)$ have a tangent plane at $(0, 0)$? Explain.

Problem 2. Let

$$g(x, y) = \frac{4x^2 + 5y^2}{3x^2 + y^2}.$$

- (a) Use Matlab to graph $z = g(x, y)$ near $(0, 0)$. Use both mesh and contour to examine the behavior of g near $(0, 0)$.
- (b) Based on your graph, does $\lim_{(x,y) \rightarrow (0,0)} g(x, y)$ exist? Explain your answer.
- (c) Based on your graph, does $z = g(x, y)$ have a tangent plane at $(0, 0)$? Explain.