MATH 126 MATHEMATICS II **Name:** (please print) _____

Quiz Nine

Lecture: ☐ 8:30 ☐ 9:30

SI: ☐ Alex ☐ Ashley ☐ Avni ☐ Becca ☐ Jason ☐ Matt

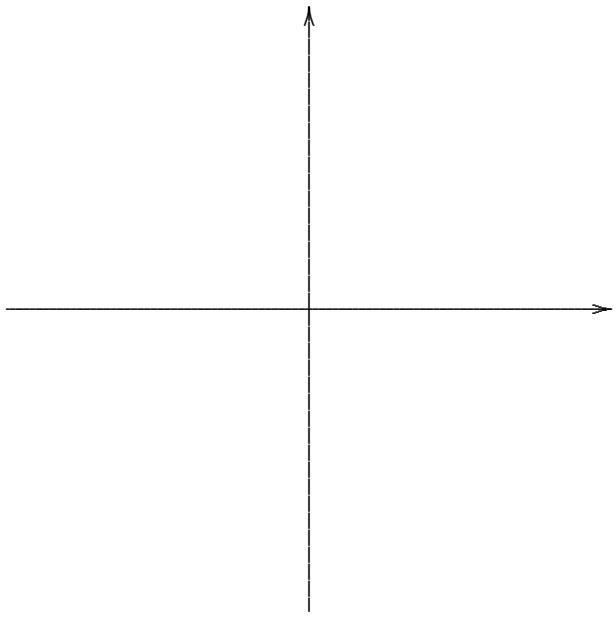
No notes. Calculators are allowed.
Write clearly and explain your reasoning.

1 (5 points) The equation

$$x^2 + y^2 + z^2 - 4x + 2y - z = 1$$

describes a sphere. Find the center and the radius of this sphere.

2 (5 points) Suppose $f(x, y) = \ln(2x^2 + 2y^2 - 18)$. Describe the domain of $f(x, y)$. Graph this domain on the axes provided.



3 (6 points) Suppose $f(x, y) = e^{3xy} + 3x^2y - 2y^2 + 15$. Calculate all the first and second partial derivatives: f_x, f_y, f_{xx}, f_{xy}, f_{yx}, and f_{yy}.

4 (4 points) BOB the writer of textbook answers tells you that for some function $g(x, y)$, the first partial derivatives are $g_x = 5x - 4y$ and $g_y = 3x + 4y$. Explain why BOB must be wrong. Use some (or all) of the second partial derivatives to justify your answer.