- 1. Let $f(x, y) = x^2 8x + 2xy 14y + 4y^2 + 19$
 - a. Find the first order partial derivatives f_x , f_y
 - b. Find the second order partial derivatives f_{xx} , f_{xy} , f_{yx} , and f_{yy}
 - c. Evaluate all of the partial derivatives at the point (3, 1).
 - d. What does your answer to c. tell you about the graph z = f(x, y)?

2. Let
$$g(x, y) = 2y^2 - 12y - 4yx + 10x + x^2$$

- a. Find the first order partial derivatives g_x , g_y
- b. Find the second order partial derivatives g_{xx} , g_{xy} , g_{yx} , and g_{yy}
- c. Evaluate all of the partial derivatives at the point (-1,2).
- d. What does your answer to c. tell you about the graph z = g(x, y)?

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