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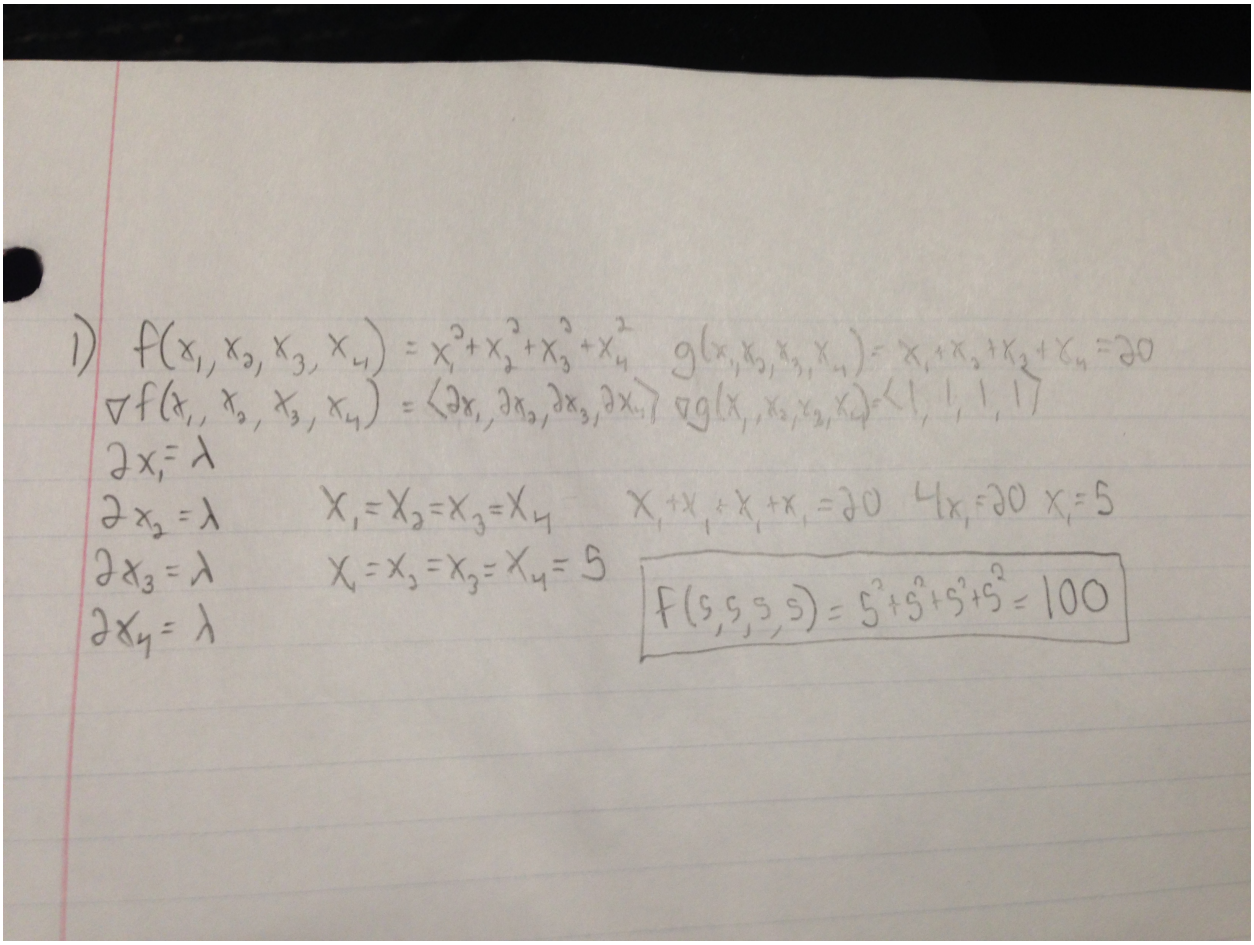
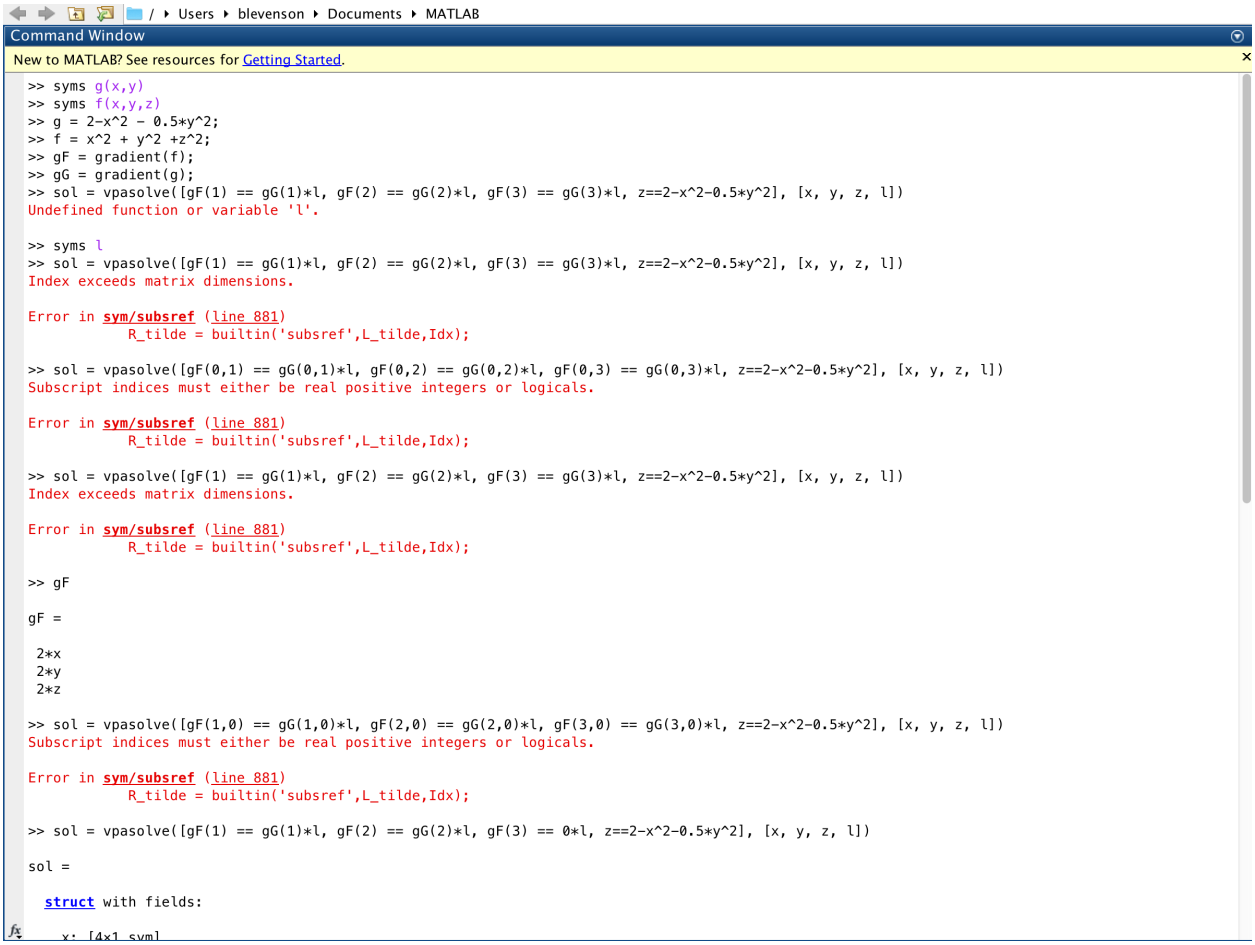
October 31, 2017
Lab 3

Exercise One



Exercise Two



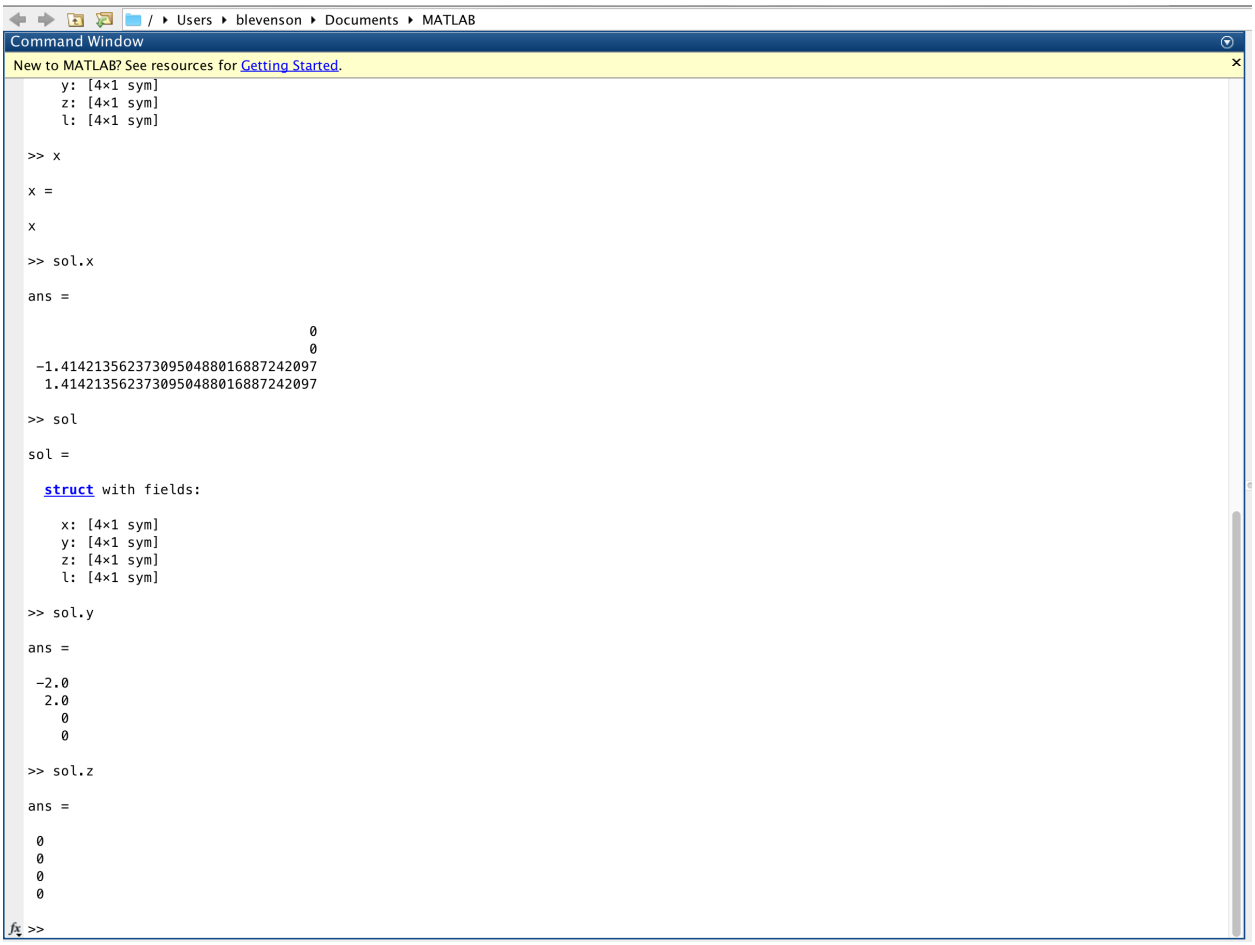


Figure 1: The solutions that work are: $(0, -2, 0), (0, 0, 0), (-1.4142, -2, 0), (-1.4142, 0, 0), (1.4142, -2, 0)$.

Exercise Three

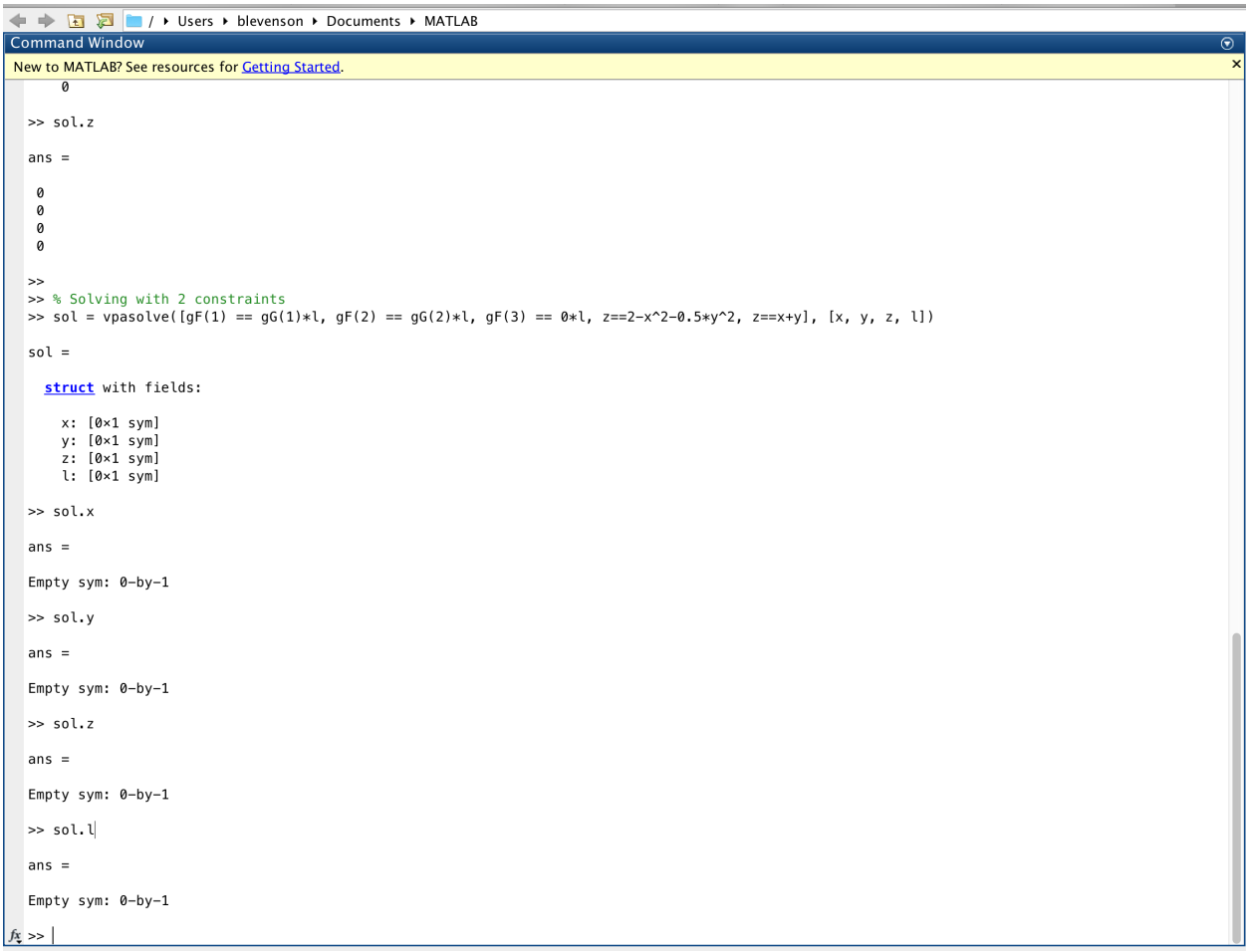
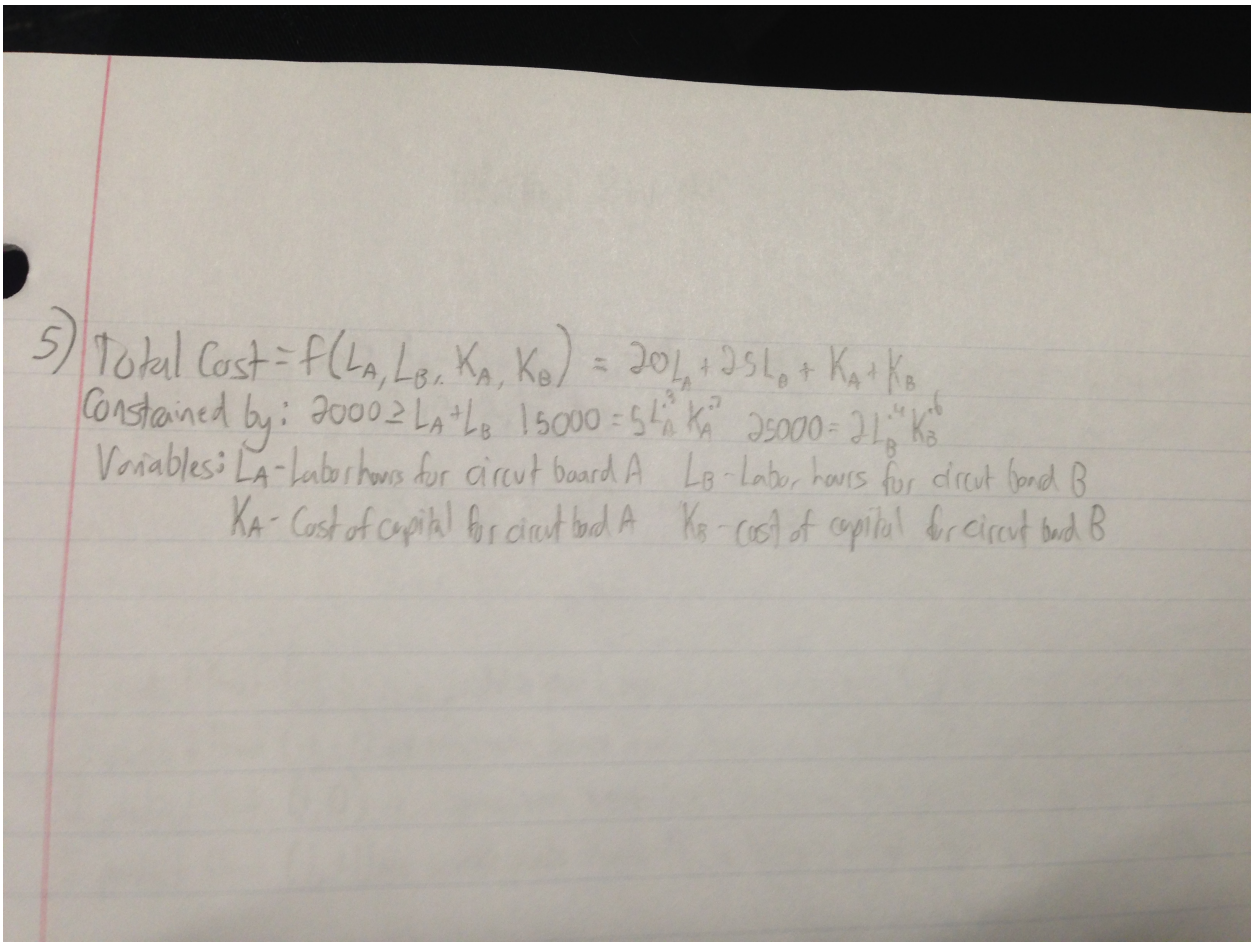


Figure 2: When solving the system with two constraints, there are no critical points of $f(x, y, z)$ constrained by the boundary. This is because the space has been overrefined, preventing any points from fulfilling both the constraints and the LaGrange multiplier equations. Because there are no points in the boundary, we are unable to determine if the gradients are linearly independent at every point on the boundary.

Exercise Four

Exercise Five



Exercise Six

Exercise Seven