MTH574/MTH474/MNE539. Numerical Optimization In-Class Worksheet 1
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Lagrange Multipliers
This worksheet will also be part of your project 1

Name : _____

1. Use Lagrange multipliers to find the maximum and minimum values of the function $f(x, y, z) = 2x + 6y + 10z$ subject to the constraint $x^2 + y^2 + z^2 = 35$.

2. Use Lagrange multipliers to find the maximum and minimum values of the function $f(x, y, z) = xy + yz$ subject to the constraints $xy = 1$ and $y^2 + z^2 = 1$

3. The plane $x + y + z = 1$ cuts the cylinder $x^2 + y^2 = 1$ in an ellipse. Find the points on the ellipse that lie closest to and farthest from the origin. It might be helpful to plot the cylinder and the plane on the same plot with MATLAB (MUPAD)