MTH 255
Mini Test 1

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(5) 1. Draw a 3-dimensional coordinate system, label the axes on the positive side of each axis, and draw tick marks with a scale. On your coordinate system, plot the rectangular point $P(1, -1, -\sqrt{6})$, then find the spherical coordinates of P.

(5) 2. Find a parametric representation for the part of the elliptic paraboloid $x + y^2 + z^2 = 4$ that lies behind the xz-plane.

(5) 3. Find an equation of the tangent plane to the parametric surface

$$\mathbf{r}(u, v) = uv\mathbf{i} + 2u \sin v \mathbf{j} + u \cos v \mathbf{k}$$

at the point where $u = 1$ and $v = 0$.

(10) 4. Let $f(x, y, z) = e^{xyz}$. Use Lagrange multipliers to find the exact values of the absolute extrema of f subject to the constraint $2x^2 + y^2 + z^2 = 24$.