Section 14.8: Additional Problems

1. Use the method of Lagrange multipliers to find the point on the plane so that the functions $f(x, y, z)$ has the least value.

   $f(x, y, z) = 4x^2 + y^2 + 5z^2$ $\qquad$ $2x + 3y + 4z = 12$

2. Use the method of Lagrange multipliers to find the point on the plane so that the function $f(x, y, z)$ has the maximum value. assume that x, y, and $z \geq 0$.

   $f(x, y, z) = xyz$ $\qquad$ $5x + y + 10z = 30$

3. Use the method of Lagrange multipliers to find the point on the ellipsoid so that the function $f(x, y, z)$ has the maximum value.

   $f(x, y, z) = 4x + 24y - 10z$ $\qquad$ $x^2 + 4y^2 + 5z^2 = 9$