Calculus III Quiz 2 9/9/5

Name: Signature:

Show your work.

Question 1
Determine the partial derivative with respect to $x$ of each of the following functions:

- $p(x, y) = (xy)^3 - e^{x^2y}$

- $q(x, y) = \tan(x^2 + y^2) + \sin^2\left(\frac{y}{x}\right)$

Question 2
Put the following conic into standard form, identify its foci and eccentricity and plot its graph:

$4x^2 + y^2 + 4x - 6y = 15.$

Question 3
Let $z(x, y) = \frac{3x}{\sqrt{49 - x^2 - y^2}}$.

- What is the domain of the function $z(x, y)$?

- Consider the part of the graph of the function $z(x, y)$ lying above the line parallel to the $y$-axis through the point $(2, 3, 1)$. Plot this graph (so put $y = 3$ in the equation of $z$ and plot $z$ against $x$). Find the slope of its tangent line to this graph at $x = 2$. 