MAT 2500-02/03 OLF Quiz 1
Print Name (Last, First):

Show all work on this sheet, including mental steps, in a clearly organized way that speaks for itself. Use proper mathematical notation/syntax. Label parts, box final short answers.

a) Show that the equation \( x^2 + y^2 + z^2 + 2x + 8y - 4z + 12 = 0 \) represents a sphere and find its center and radius.

b) Using a diagram like the one below, sketch the center point on a set of coordinate axes.

\[ (-1, 2, 1) \]

\[ \text{Diagram of a sphere centered at } (-1, 2, 1) \]

c) What is the intersection of the sphere with the x-y plane \( z = 0 \)? Describe the curve in words after deriving its equation (in a standard form). Make a rough sketch of this curve in the x-y plane.