1. Graph and describe the graph of $x^2 = y^2$ in 3-space.

Either factor or take $\pm$-u to Both sides. A point satisfies $x^2 = y^2$ if $x=y$ or $x=-y$.

So the graph is the union of 2 planes.

![Graph of $x^2 = y^2$](image)

2. Graph and describe the graph of $x^2 + z^2 = 0$ in 3-space.

The only way for 2 non-negative numbers to add to zero is if EACH of the numbers is zero. A point satisfies the equation if $x=0$ and $z=0$. The graph is the y-axis.

![Graph of $x^2 + z^2 = 0$](image)

3. Graph and describe the graph of $x^2 + y^2 + z^2 = 1$ in 3-space.

This is the sphere of radius 1 with center (0,0,0).

![Graph of $x^2 + y^2 + z^2 = 1$](image)