Example 1: Determine whether the points $A (2,4,2)$, $B (3,7,-2)$, and $C (1,3,3)$ lie on a straight line.

Example 2: Find the equation of a sphere with center $(2,-5,1)$ and radius 2. How does this sphere intersect the 3 coordinate planes?

Example 3: Find the equation of a sphere if one of its diameters has endpoints $(2,-1,1)$ and $(-2,-3,2)$.

Example 4: Describe the region represented by the inequality $x^2 + y^2 + z^2 > 2z$. 