

An equation of the sphere with center $(1, -6, 3)$ and radius 5 is

$$(x - 1)^2 + [y - (-6)]^2 + (z - 3)^2 = 5^2 \text{ or}$$

$$(x - 1)^2 + (y + 6)^2 + (z - 3)^2 = 25.$$

The intersection of this sphere with the yz -plane is the set of points on the sphere whose x -coordinate is 0 . Putting $x = 0$ into the equation, we have $(y + 6)^2 + (z - 3)^2 = 24$, $x = 0$ which represents a circle in the yz -plane with center $(0, -6, 3)$ and radius $2\sqrt{6}$.

To find the intersection with the xy -plane, we set $z = 0$:

$$(x - 1)^2 + (y + 6)^2 = 16, z = 0, \text{ a circle in the } xy\text{-plane with center } (1, -6, 0) \text{ and radius } 4.$$