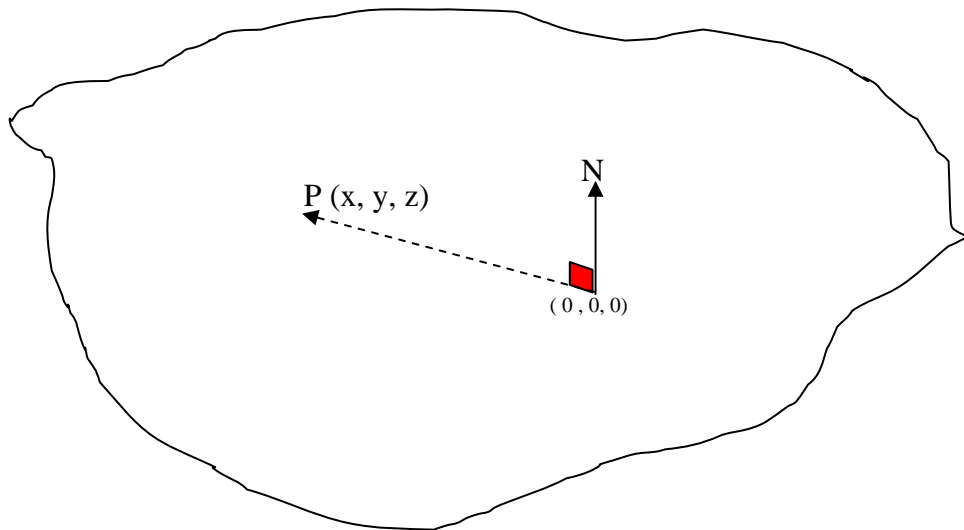# Some Notes on the Geometry of Vector Cryptography 3.

Equation of a Plane.

Lemma:

The Dot product of any two mutually perpendicular vectors is always zero.

The vector $\bar{P}$ is: $\begin{pmatrix} x - 0 \\ y - 0 \\ z - 0 \end{pmatrix}$ $\bar{N} = \begin{pmatrix} \alpha \\ \beta \\ \gamma \end{pmatrix}$ $\begin{pmatrix} \alpha \\ \beta \\ \gamma \end{pmatrix} \bullet \begin{pmatrix} x - 0 \\ y - 0 \\ z - 0 \end{pmatrix} \Rightarrow \begin{pmatrix} \alpha x \\ \beta y \\ \gamma z \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}$

By means of the Lemma:

When the plane passes thro' the origin the equation of that plane is :

$$\alpha x + \beta + \gamma z = 0 \quad \text{(A standard result in vector geometry)}$$

This cryptography always uses a plane that passes through the origin.