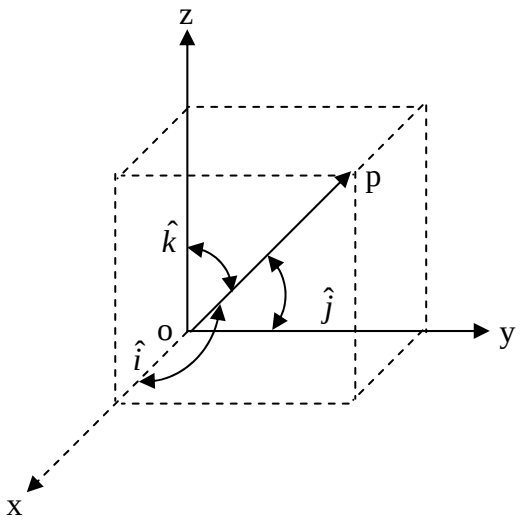
Some Notes on the Geometry of My ASLEC Cipher.

Direction of a Vector



OP is a vector starting at ‘o ‘ i.e. at the origin (o, o, o)..
It is in fact a directed line segment..

If OP was projected on to each of the Cartesian axes in turn it would subtend an amount equal to $\hat{i}$ coefficient on the X axis, an amount equal to $\hat{j}$ coefficient on the Y axis and an amount equal to $\hat{k}$ coefficient on the Z axis.

It can be seen that these amounts (coefficients of $\hat{i}$, $\hat{j}$, $\hat{k}$ respectively) can be varied and they control the direction of vectors in space.. They are called direction ratios because they are a ratio of three numbers that are assigned as the three coefficients of the unit vectors. $\hat{i}$, $\hat{j}$, $\hat{k}$.

Comment:

A vector has magnitude and direction. In this cryptography we are not interested in the magnitude but in passing,

$$|v| = \sqrt{i^2 + j^2 + k^2}$$

$|v|$ is always a positive number. Directed number lines always have a fixed periodicity i.e. the space between integers is always fixed and it is equal to the magnitude of the direction vector in use. That is not of any great interest in cryptography however.

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