3D Cartesian Vectors

When looking at 3D vectors, we look at it now having 3 coordinates. [x,y,z]

For each axes; x may also be represented as i and is written as [1,0,0]

y may also be represented as j and is written as [0,1,0]

z may also be represented as k and is written as [0,0,1]

z

y

x

Rules For 3D Vector

**1) Magnitude of a Cartesian Vector**

For vector = [a,b,c] ll =

**2) Scalar Multiplication**

For any vector = [a,b,c] where kER, k = [k]

**3) Vector Addition**

If = [a,b,c] and = [d,e,f] then

= [a+d, b+e, c+f]

**4) Vector Suntraction**

If = [a,b,c] and = [d,e,f]

then = [a-d, b-e, c-f]

**5) Vector Between 2 Points**

The vector from point (,,) to (,,) is

= (, , )

**6) Magnitude of a Vector Between Two Points**

The magnitude of the vector between the points (,,) and (,,) is

=

**7) Dot Product**

If = [a,b,c] and = [d,e,f] then

= ad + be + cf