SUVA SANGAM COLLEGE
YEAR 13
MATHEMATICS
WORKSHEET 7

Strand 2	Vectors
Sub-Strand	Norm of a vector and Unit Vectors
Content Learning Outcome	Find norm and unit vectors
Reference from Text	Pg 42 - 45

Questions

	CONCEPT IN BRIEF: Norm of a vector $\tilde{a}$ is the length of the vector. It is also known as modulus or magnitude. The symbol is $\|a\|$ and is found using Pythagoras theorem: $$\|a\| = \sqrt{x^2 + y^2 + z^2}$$
1.	Find the magnitude of the following vectors: (a) $\tilde{a} = \begin{pmatrix} 1 \\ -3 \\ 4 \end{pmatrix}$ (b) $\tilde{b} = \begin{pmatrix} -3 \\ 2 \\ 1 \end{pmatrix}$
	CONCEPT IN BRIEF: A unit vector is any vector which is of 1 unit length. Unit vectors in the direction of *x, y,* and *z*- axis are denoted by **i**, **j** and **k**.
2.	Vectors are given as $\tilde{x} = \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix}$ and $\tilde{y} = \begin{pmatrix} 1 \\ 3 \\ -1 \end{pmatrix}$, find: (a) Express $\tilde{x}\ and\ \tilde{y}$ in terms of unit vectors $i\ ,j\ and\ k$. (b) Find $2\tilde{y} - \tilde{x}$ and express in terms of unit vectors $i\ ,j\ and\ k$.
	CONCEPT IN BRIEF: Normalizing a vector which is finding a unit vector in the same direction $$\frac{d}{\|d\|} \rightarrow unit\ vector\ in\ the\ direction\ of\ d$$
3.	A vector is given as $\tilde{p} = 4i - 4j + 7k$ a) Find the modulus of $\tilde{p} = 4i - 4j + 7k$ b) Find the unit vector in the direction of $\tilde{p} = 4i - 4j + 7k$.