

SANGAM SKM COLLEGE NADI
YEAR 13 MATHEMATICS
WORKSHEET 2: WEEK 3 - VECTORS

1. Find $\begin{pmatrix} 7 \\ 5 \\ -4 \end{pmatrix} + 2 \begin{pmatrix} -5 \\ 0 \\ 3 \end{pmatrix}$

2. Point $P_1 = (-1, 0, -2)$ and $P_2 = (-5, -2, 4)$. Find the vector $\overrightarrow{P_1P_2}$ in terms of the **unit vectors** i, j and k .

3. Two vectors \underline{a} and \underline{b} are defined as $\underline{a} = \begin{pmatrix} 2 \\ -4 \\ -4 \end{pmatrix}$ and $\underline{b} = \begin{pmatrix} 2 \\ -1 \\ -2 \end{pmatrix}$

a) Find $|\underline{a}|$

b) Find $|\underline{b}|$

c) Determine the dot product of \underline{a} and \underline{b} .

d) Hence, calculate the angle between \underline{a} and \underline{b} .

4. The symmetric equation of a line is given as

$$\frac{3-x}{-2} = y + 2 = \frac{4z-8}{-4}$$

Write the **parametric equation** of this line.

5. If P is any point on a line segment AB which divides it in the ratio $m : n$,

then $P = \frac{n\underline{a} + m\underline{b}}{m+n}$

Let point A = (7, 7, 8) and point B = (-2, 1, -1). Determine the **coordinates** of point P on the line AB given that AP: PB = 1: 2