**National 5 Homework : 1 year course**
**Vectors**

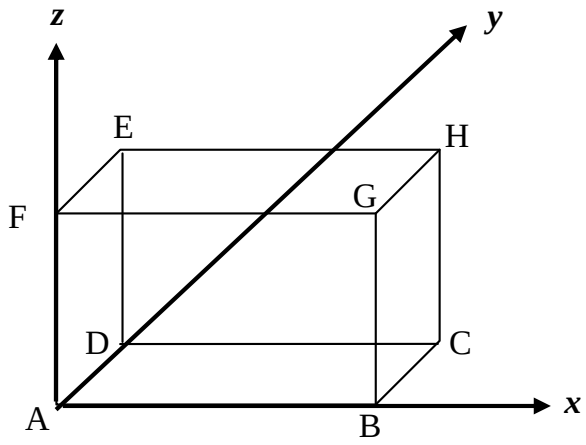
1. a) Draw a vector diagram for **m** and **n** and the resultant vector **m** + **n** if:-

$\mathbf{m} = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$ and $\mathbf{n} = \begin{pmatrix} 3 \\ 1 \end{pmatrix}$

b) State the components of **m** + **n.**

c) Calculate the magnitude of **m** + **n.**

2. On the diagram below A is the point (0,0,0) and H is (8,3,6).




a) Write down the coordinates of
(i) E (ii) C.

b) **a** = $\overrightarrow{DH}$ write down the components of **a**.

c) If the two space diagonals, AH and EB, are drawn where will they cross?

3. If **a** = $\begin{pmatrix} 4 \\ -3 \\ 6 \end{pmatrix}$ and **b** = $\begin{pmatrix} -4 \\ -5 \\ -7 \end{pmatrix}$ calculate the resultant vector of 3**a** + 4**b.**

4. Calculate the magnitude of $\overrightarrow{AB}$ if A $\begin{pmatrix} 2 \\ 3 \\ 7 \end{pmatrix}$ and B $\begin{pmatrix} 5 \\ -6 \\ 8 \end{pmatrix}$.

5. Prove that triangle PQR is isosceles if P(3,4,-1), Q(9,8,11) and R (-9, -2, 3).