



## Show all working – NO Calculator allowed unless stated.

- 1. 2 vectors  $\underline{p}$  and  $\underline{q}$  are shown in the diagram
  - a) Write down the components of the vectors *p* and *q*
  - **b**) Draw diagrams to represent the vectors:
    - i)  $\boldsymbol{p} + \boldsymbol{q}$  (ii)  $\boldsymbol{p} \boldsymbol{q}$





A t	riangular prism is shown in the diagram.	
The	e coordinates of F are (10, 6, 3)	
a)	Write down the coordinates of	
	the remaining vertices B, C, D & E	(4)

- b) Find the area of the face BCF (2)
- c) If *M* is the midpoint of side *EF*. Express each of the following vector journeys in terms of  $\underline{u}$ ,  $\underline{v}$  and  $\underline{w}$ : i)  $\overrightarrow{AF}$  (ii)  $\overrightarrow{EB}$  (iii)  $\overrightarrow{CM}$  (iv)  $\overrightarrow{AM}$
- 3. The components of 3 vectors ,  $\underline{\nu}$  and  $\underline{\mu}$  are given by  $\begin{pmatrix} 2\\4\\-4 \end{pmatrix}$ ,  $\begin{pmatrix} 6\\-3\\3 \end{pmatrix}$  and  $\begin{pmatrix} -4\\0\\5 \end{pmatrix}$  respectively
  - a) Find the components of the following
    - i)  $2\underline{\boldsymbol{\nu}} \underline{\boldsymbol{\nu}}$  (ii)  $-2 + 3\underline{\boldsymbol{\nu}}$  (iii)  $\frac{1}{2}\underline{\boldsymbol{\nu}} + \frac{2}{3}\underline{\boldsymbol{\nu}}$  (6)
  - **b**) Calculate the magnitude of the following
    - i)  $|\underline{u}|$  (ii)  $|\underline{u}-2\underline{w}|$



(	5)
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(3)

(4)

## Total Marks: 30