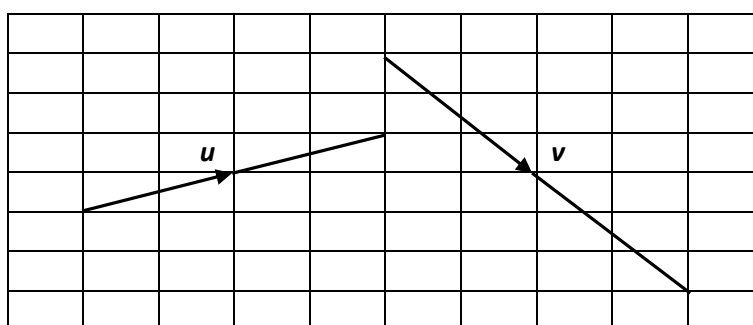
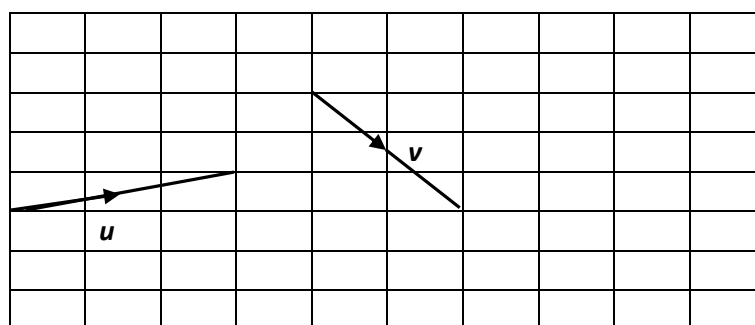


National 5 Topic Revision	Applications
Geometric Skills	Working with Vectors
Average Allocation	2 / 3 Marks

- Vector $\mathbf{a}$ has components $\begin{pmatrix} 6 \\ 5 \end{pmatrix}$ and vector $\mathbf{b}$ has components $\begin{pmatrix} 1 \\ 7 \end{pmatrix}$. Find the magnitude of vector $|\mathbf{a} - \mathbf{b}|$.
- Vector $\mathbf{u}$ has components $\begin{pmatrix} 4 \\ 2 \end{pmatrix}$ and vector $\mathbf{v}$ has components $\begin{pmatrix} 5 \\ 3 \end{pmatrix}$. Find the components of the resultant vector $2\mathbf{u} - 3\mathbf{v}$.
- Vectors $\mathbf{u}$ and $\mathbf{v}$ are shown in the diagram below. Write down the components of the resultant vector $\mathbf{u} + \mathbf{v}$ and hence calculate $|\mathbf{u} + \mathbf{v}|$. Write your answer as a surd in its simplest form.

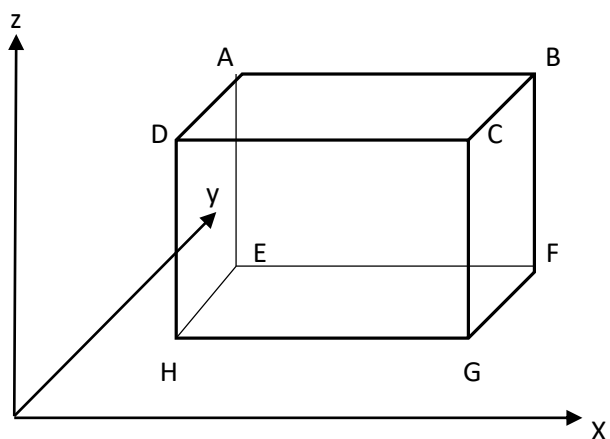


- Vector $\mathbf{p}$ has components $\begin{pmatrix} 2 \\ 4 \\ -3 \end{pmatrix}$ and vector $\mathbf{q}$ has components $\begin{pmatrix} -2 \\ 5 \\ 2 \end{pmatrix}$. Write down the components of the resultant vector $2\mathbf{p} - 3\mathbf{q}$.
- Vectors $\mathbf{u}$ and $\mathbf{v}$ are shown in the diagram below. Calculate, in component form, $3\mathbf{u} - 2\mathbf{v}$ and hence find $|3\mathbf{u} - 2\mathbf{v}|$.



- Find the resultant vector $5\mathbf{p} - 2\mathbf{q}$ where $\mathbf{p} = \begin{pmatrix} 1 \\ 2 \\ -1 \end{pmatrix}$ and $\mathbf{q} = \begin{pmatrix} -2 \\ -2 \\ 3 \end{pmatrix}$.
- Vector $\mathbf{p} = \begin{pmatrix} -1 \\ 3 \\ t \end{pmatrix}$ and $\mathbf{q} = \begin{pmatrix} a \\ 1 \\ 4 \end{pmatrix}$. If $4\mathbf{p} - 3\mathbf{q} = \begin{pmatrix} -10 \\ k \\ -4 \end{pmatrix}$, find the values of a , k and t .

8.



In the diagram above, $ABCDEFGH$ is a cuboid. E has coordinates $(1, 5, 2)$ and C has coordinates $(6, 2, 8)$. Write down the coordinates of A and G and H .