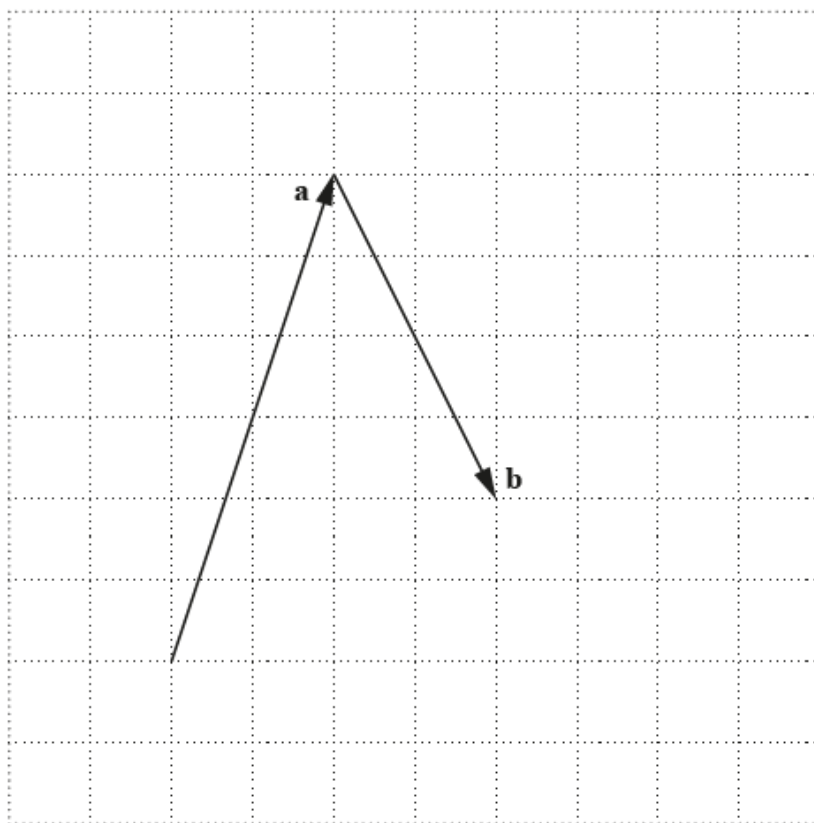


Vectors Exam Questions

Q1, (OCR H240/02, Practice Paper Set 1, Q1)

Vectors \mathbf{a} and \mathbf{b} are defined as follows: $\mathbf{a} = 2\mathbf{i} + 6\mathbf{j}$ and $\mathbf{b} = 2\mathbf{i} - 4\mathbf{j}$.

- (i) Given that $p\mathbf{a} + q\mathbf{b} = 6\mathbf{i} - 7\mathbf{j}$, find the values of the constants p and q . [3]
- (ii) It is now given instead that $|\mathbf{a} + k\mathbf{b}| = 5$. Use the diagram in the Printed Answer Booklet to find the two possible values of the constant k . [4]



Q2, (OCR H230/02, Specimen Question Paper, Q4)

The points A , B and C have position vectors $\begin{pmatrix} -2 \\ 1 \end{pmatrix}$, $\begin{pmatrix} 2 \\ 5 \end{pmatrix}$ and $\begin{pmatrix} 6 \\ 3 \end{pmatrix}$ respectively. M is the midpoint of BC .

- (i) Find the position vector of the point D such that $\overline{BC} = \overline{AD}$. [3]
- (ii) Find the magnitude of \overline{AM} . [3]

Q3, (OCR H230/01, Practice Paper Set 1, Q7)

The point A has position vector $\mathbf{i} - 2\mathbf{j}$. The point B is such that $|\vec{OB}| = |\vec{OA}|$ and \vec{OB} is perpendicular to \vec{OA} .

(i) (a) Find $|\vec{OB}|$. [2]

(b) Find the two possible directions of \vec{OB} , giving your answers correct to the nearest degree. [2]

The point C is such that $|\vec{AC}| = 2$.

(ii) Find the maximum and minimum values of $|\vec{OC}|$. [4]
