Vectors
Difficulty: Hard

Question Paper 1

Level	IGCSE
Subject	Maths (0580/0980)
Exam Board	CIE
Topic	Vectors and transformations
Sub-Topic	Vectors
Paper	Paper 2
Difficulty	Hard
Booklet	Question Paper 1

Time allowed: **28 minutes**

Score: **/22**

Percentage: **/100**

Grade Boundaries:

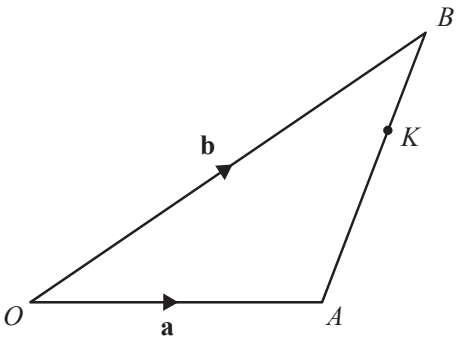
CIE IGCSE Maths (0580)

A*	A	B	C	D	E
>88%	76%	63%	51%	40%	30%

CIE IGCSE Maths (0980)

9	8	7	6	5	4	3
>94%	85%	77%	67%	57%	47%	35%

Question 1

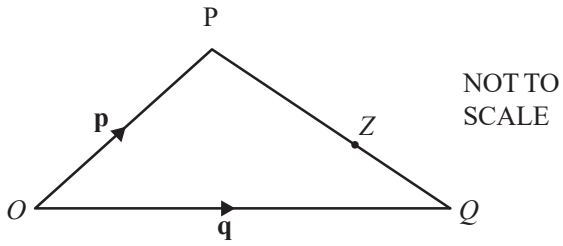


NOT TO SCALE

O is the origin and K is the point on AB so that $AK : KB = 2 : 1$.
$\overrightarrow{OA} =$ **a** and $\overrightarrow{OB} =$ **b**.

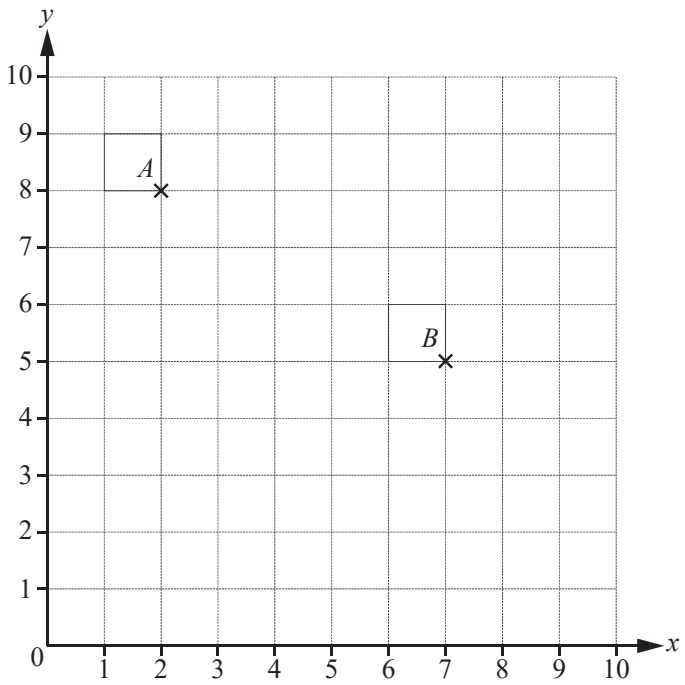
Find the position vector of K.
Give your answer in terms of **a** and **b** in its simplest form. [3]

Question 2



O is the origin, $\overrightarrow{OP} =$ **p** and $\overrightarrow{OQ} =$ **q**.
Z is a point on PQ such that $PZ : ZQ = 5 : 2$.

Work out, in terms of **p** and **q**, the position vector of Z.
Give your answer in its simplest form. [3]



Points A and B are marked on the grid.

$\overrightarrow{BC} = \begin{pmatrix} -4 \\ 0 \end{pmatrix}$

(a) On the grid, plot the point C. [1]

(b) Write $\overrightarrow{AC}$ as a column vector. [1]

(c) $\overrightarrow{DE}$ is a vector that is perpendicular to $\overrightarrow{BC}$.
The magnitude of $\overrightarrow{DE}$ is equal to the magnitude of $\overrightarrow{BC}$.

Write down a possible column vector for $\overrightarrow{DE}$. [2]

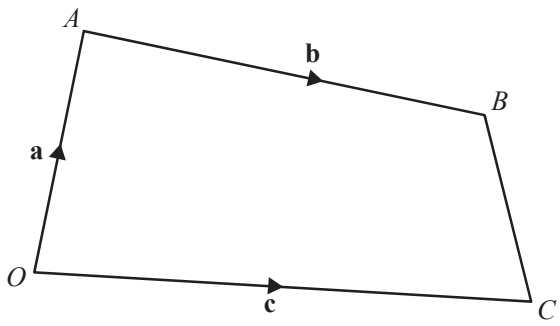
Question 4

Work out

$$2\begin{pmatrix}3\\5\end{pmatrix}-\begin{pmatrix}1\\2\end{pmatrix}$$

[1]

Question 5



NOT TO SCALE

In the diagram, O is the origin, $\overrightarrow{OA} = \mathbf{a}$, $\overrightarrow{OC} = \mathbf{c}$ and $\overrightarrow{AB} = \mathbf{b}$.
P is on the line AB so that $AP : PB = 2 : 1$.
Q is the midpoint of BC.

Find, in terms of **a**, **b** and **c**, in its simplest form

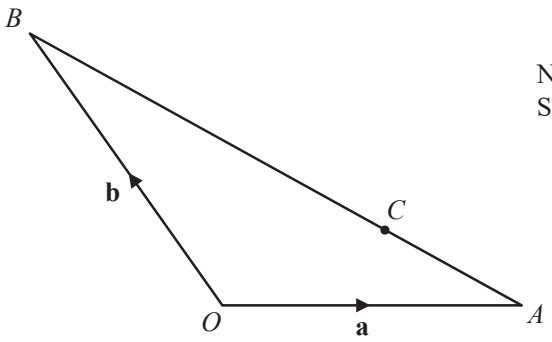
(a) $\overrightarrow{CB}$, [1]

(b) the position vector of Q, [2]

(c) $\overrightarrow{PQ}$. [2]

$$\overrightarrow{AB} = \begin{pmatrix} -3 \\ 5 \end{pmatrix}$$

Find $|\overrightarrow{AB}|$. [2]



In the diagram, O is the origin, $\overrightarrow{OA} = \mathbf{a}$ and $\overrightarrow{OB} = \mathbf{b}$.
C is on the line AB so that $AC : CB = 1 : 2$.

Find, in terms of **a** and **b**, in its simplest form,

(a) $\overrightarrow{AC}$, [2]

(b) the position vector of C. [2]