

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:

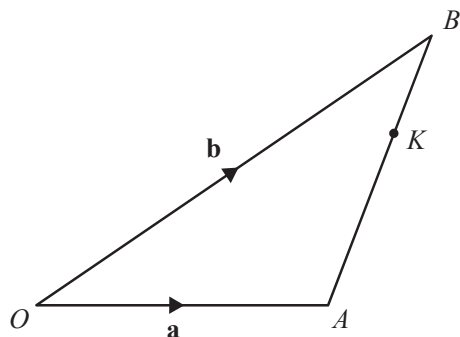
CIE IGCSE Maths (0580)

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

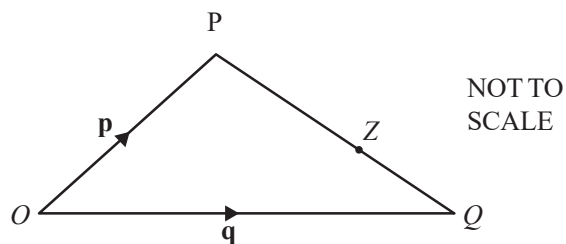
O is the origin and K is the point on AB so that $AK : KB = 2 : 1$.
 $\vec{OA} = \mathbf{a}$ and $\vec{OB} = \mathbf{b}$.

Find the position vector of K .

Give your answer in terms of \mathbf{a} and \mathbf{b} in its simplest form.

[3]

Question 2

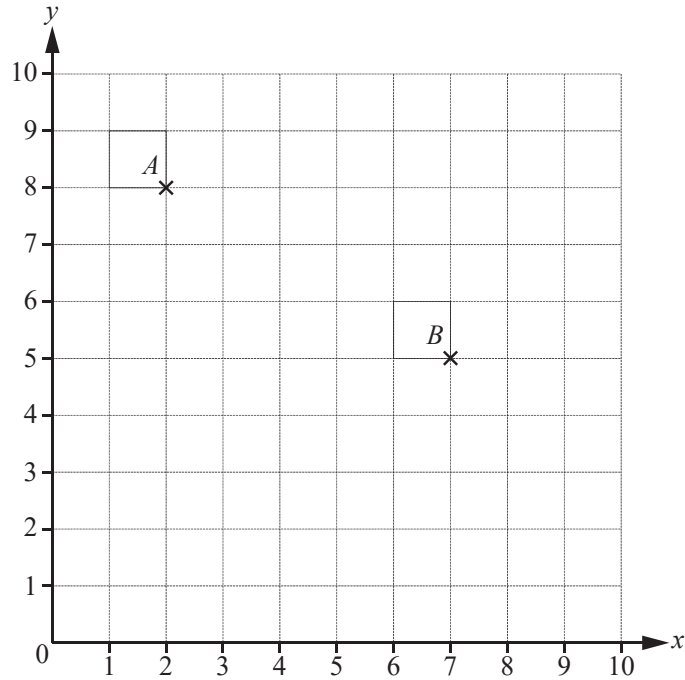


O is the origin, $\vec{OP} = \mathbf{p}$ and $\vec{OQ} = \mathbf{q}$.
 Z is a point on PQ such that $PZ : ZQ = 5 : 2$.

Work out, in terms of \mathbf{p} and \mathbf{q} , the position vector of Z .
Give your answer in its simplest form.

[3]

Question 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 DE is equal to the magnitude of \overrightarrow{BC} . [2]

Write down a possible column vector for \overrightarrow{DE} .

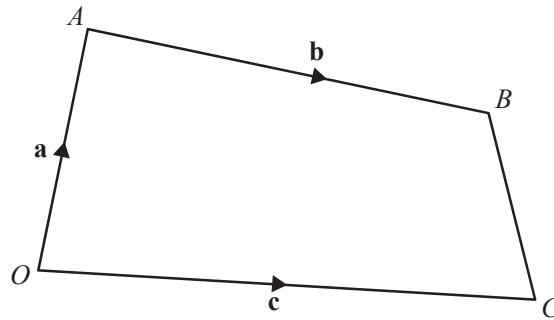
Question 4

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

Find, in terms of \mathbf{a} , \mathbf{b} and \mathbf{c} , in its simplest form

(a) \vec{CB} , [1]

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

(c) \vec{PQ} . [2]

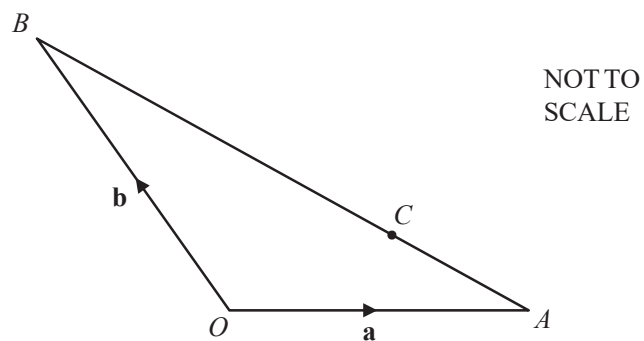
Question 6

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

Find $|\overrightarrow{AB}|$.

[2]

Question 7



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

Find, in terms of \mathbf{a} and \mathbf{b} , in its simplest form,

(a) \vec{AC} , [2]

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