Vectors
Difficulty: Easy

Question Paper 3

Level	IGCSE
Subject	Maths (0580/0980)
Exam Board	CIE
Topic	Vectors and transformations
Sub-Topic	Vectors
Paper	Paper 2
Difficulty	Easy
Booklet	Question Paper 3

Time allowed: **37 minutes**

Score: **/29**

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%
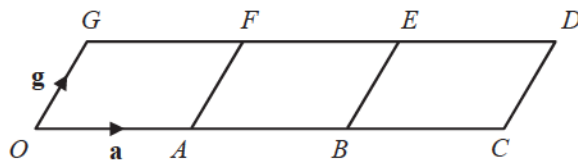
The diagram is made from three identical parallelograms.

O is the origin. $\overrightarrow{OA} = \mathbf{a}$ and $\overrightarrow{OG} = \mathbf{g}$.

Write down in terms of $\mathbf{a}$ and $\mathbf{g}$

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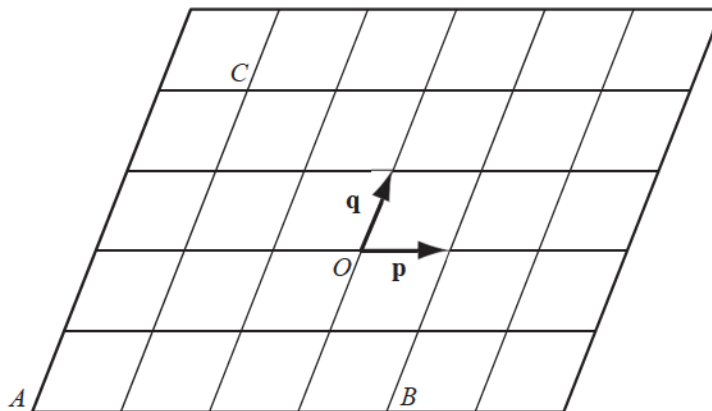
[1]

(b) the position vector of the centre of the parallelogram $BCDE$.

[1]

O is the origin. Vectors p and q are shown in the diagram.

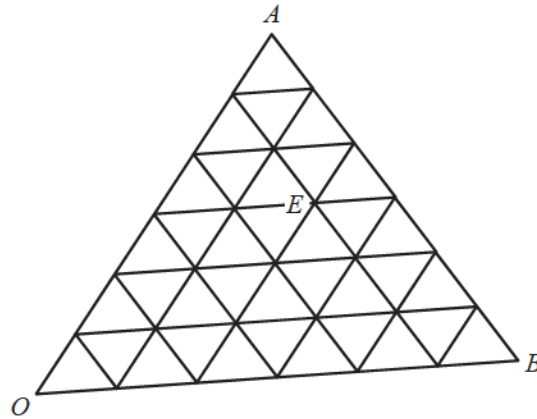(a)   Write down, in terms of p and q, in their simplest form

    (i)   the position vector of the point A,   [1]

    (ii) $\overrightarrow{BC}$,   [1]

    (iii) $\overrightarrow{BC} - \overrightarrow{AC}$.   [2]

(b) If $|\,p\,| = 2$, write down the value of $|\,AB\,|$.   [1]

O is the origin, $\overrightarrow{OA}$ = a and $\overrightarrow{OB}$ = **b**.

(a) C has position vector $\dfrac{1}{3}$ **a** + $\dfrac{2}{3}$ **b**.

Mark the point C on the diagram.　　　　　　　　　　　　　　　　　　　　[1]

(b) Write down, in terms of **a** and **b**, the position vector of the point E.　　[1]

(c) Find, in terms of **a** and **b**, the vector $\overrightarrow{EB}$.　　　　　　　　　　　　[2]
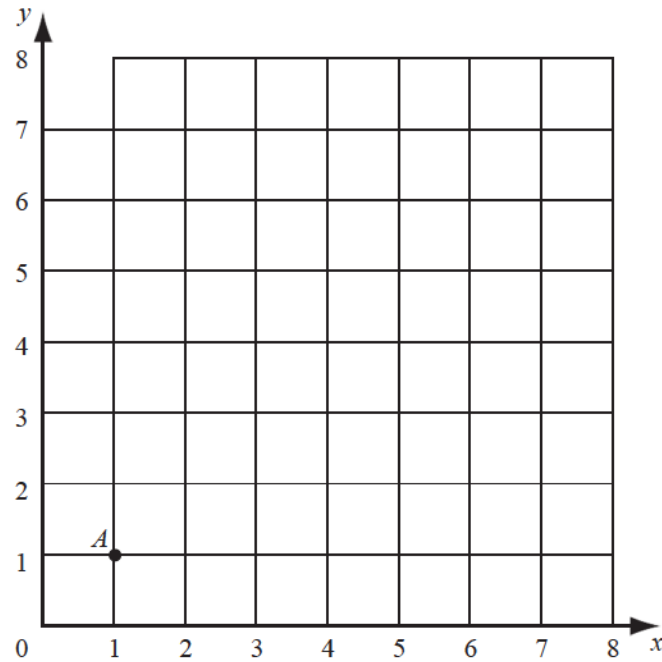
(a) Using a scale of 1cm to represent 1 unit, draw the vectors

$\overrightarrow{AB} = \begin{pmatrix} 3 \\ 5 \end{pmatrix}$ and $\overrightarrow{BC} = \begin{pmatrix} 4 \\ 0 \end{pmatrix}$ on the grid above. [2]

(b) *ABCD* is a parallelogram.
Write down the coordinates of *D*. [2]

(c) Calculate $|\overrightarrow{AB}|$. [2]
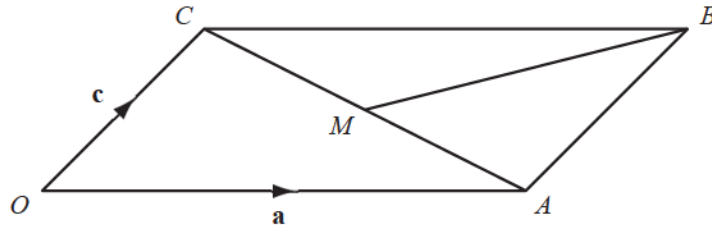
$OABC$ is a parallelogram. $\overrightarrow{OA}$ = a, $\overrightarrow{OC}$ = c and M is the mid-point of CA.
Find in terms of a and c

(a) $\overrightarrow{OB}$,

[1]

(b) $\overrightarrow{CA}$,

[1]

(c) $\overrightarrow{BM}$.

[2]
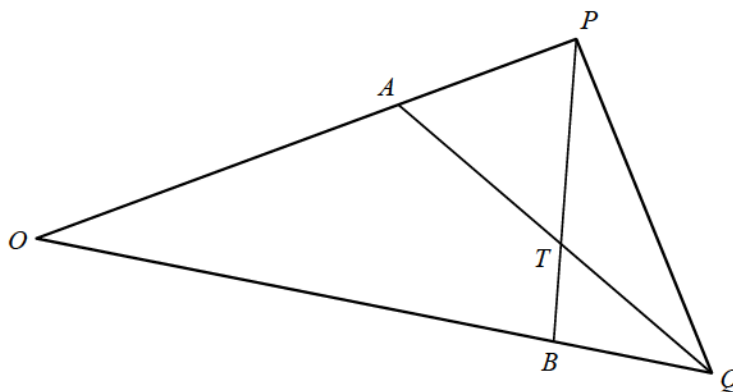
NOT TO
SCALE

In the diagram $OA = \frac{2}{3}OP$ and $OB = \frac{3}{4}OQ$.
$\overrightarrow{OP} = \mathbf{p}$ and $\overrightarrow{OQ} = \mathbf{q}$.

[2]

(a) Find in terms of $\mathbf{p}$ and $\mathbf{q}$

    (i) $\overrightarrow{AQ}$,

[2]

    (ii) $\overrightarrow{BP}$.

(b) AQ and BP intersect at T.
    $BT = \frac{1}{3}BP$.
    Find $\overrightarrow{QT}$ in terms of $\mathbf{p}$ and $\mathbf{q}$, in its simplest form.

[2]

$\mathbf{a} = \begin{pmatrix} 2 \\ -3 \end{pmatrix}$ and $\mathbf{b} = \begin{pmatrix} 5 \\ -1 \end{pmatrix}$ Find $3\mathbf{a} - 2\mathbf{b}$.   [2]