Write your name here

Surname	Other names

In the style of:

Edexcel GCSE

Centre Number	Candidate Number

Mathematics A

Vectors

Higher Tier

Past Paper Style Questions
Arranged by Topic

Paper Reference
1MA0/1H

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- **Calculators must not be used.**

Information

- The total mark for this paper is 100
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

1.

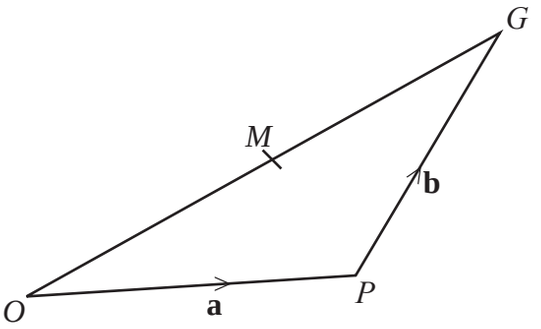


Diagram **NOT** accurately drawn

OGP is a triangle.

M is the midpoint of *OG*.

$\overrightarrow{OP}$ = **a**

$\overrightarrow{PG}$ = **b**

(a) Express $\overrightarrow{OM}$ in terms of **a** and **b**.

$\overrightarrow{OM}$ = ...

(2)

(b) Express $\overrightarrow{PM}$ in terms of **a** and **b**

Give your answer in its simplest form.

$\overrightarrow{PM}$ = ...

(2)

(Total 4 marks)

2.

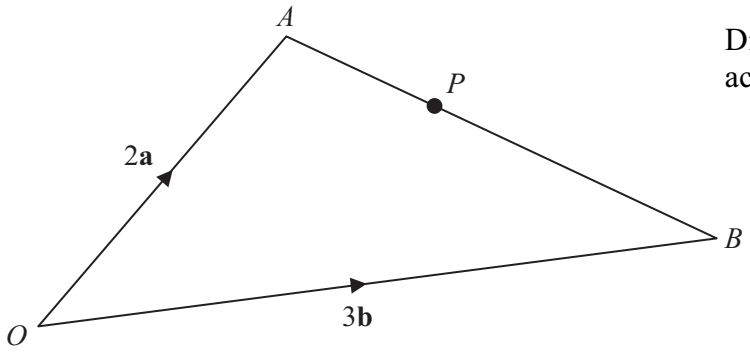


Diagram **NOT** accurately drawn

OAB is a triangle.

$\overrightarrow{OA} = 2\mathbf{a}$

$\overrightarrow{OB} = 3\mathbf{b}$

(a) Find $\overrightarrow{AB}$ in terms of **a** and **b**.

$\overrightarrow{AB}$ = ...

(1)

P is the point on AB such that $AP : PB = 2 : 3$

(b) Show that $\overrightarrow{OP}$ is parallel to the vector $\mathbf{a} + \mathbf{b}$.

(3)

(Total 4 marks)

3.

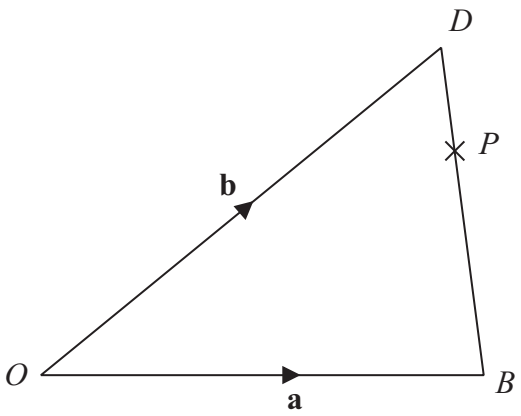


Diagram **NOT** accurately drawn

ODB is a triangle.

$\overrightarrow{OB} = \mathbf{a}$

$\overrightarrow{OD} = \mathbf{b}$

(a) Find $\overrightarrow{BD}$ in terms of **a** and **b**.

.....

(1)

P is the point on *DB* such that $DP : PB = 3 : 1$

(b) Find $\overrightarrow{OP}$ in terms of **a** and **b**.
Give your answer in its simplest form.

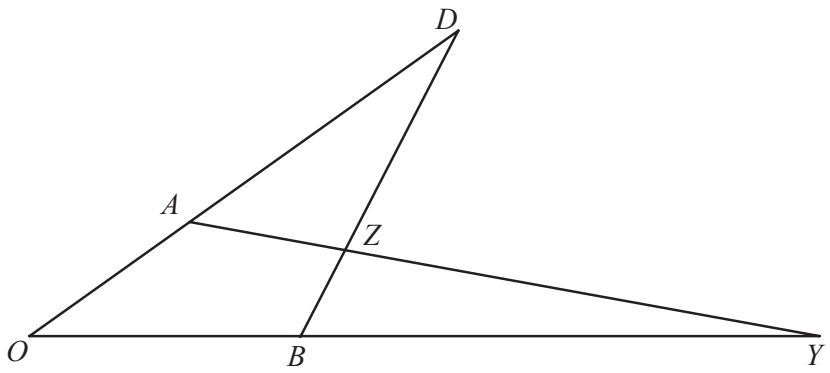
.....

(3)

(Total 4 marks)

4.

Diagram **NOT** accurately drawn



In the diagram,

$\overrightarrow{OA} = 4\mathbf{a}$ and $\overrightarrow{OB} = 4\mathbf{b}$

OAD, OBY and BZD are all straight lines

$AD = 2OA$ and $BZ : ZD = 1:3$

(a) Find, in terms of **a** and **b**, the vectors which represent

(4)

(i) $\overrightarrow{BD}$

.....

(ii) $\overrightarrow{AZ}$

.....

Given that $\overrightarrow{BY} = 8\mathbf{b}$

(b) Show that AZY is a straight line.

(3)

(Total 7 marks)

5.

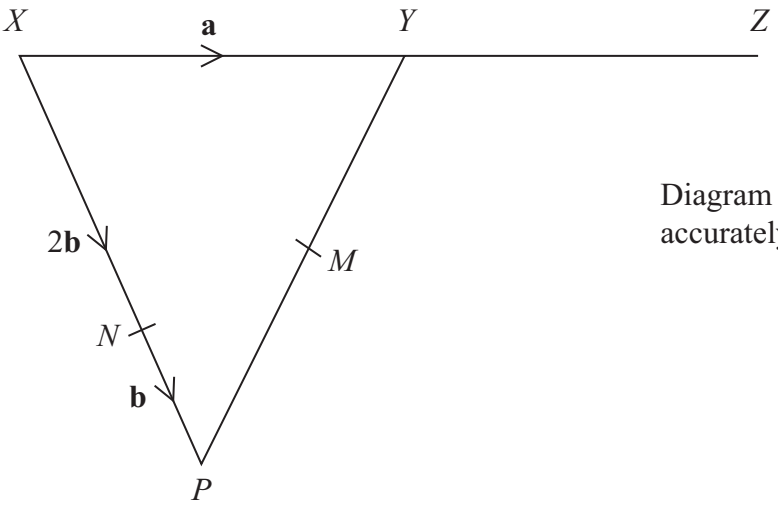


Diagram **NOT** accurately drawn

XYP is a triangle
N is a point on *AP*

$\overrightarrow{XY} = \mathbf{a}$ $\overrightarrow{XN} = 2\mathbf{b}$ $\overrightarrow{NP} = \mathbf{b}$

(a) Find the vector $\overrightarrow{PX}$, in terms of **a** and **b**.

.....

(1)

Y is the midpoint of *XZ*
M is the midpoint of *PY*

(b) Show that *NMZ* is a straight line.

(4)

(Total 5 marks)

6.

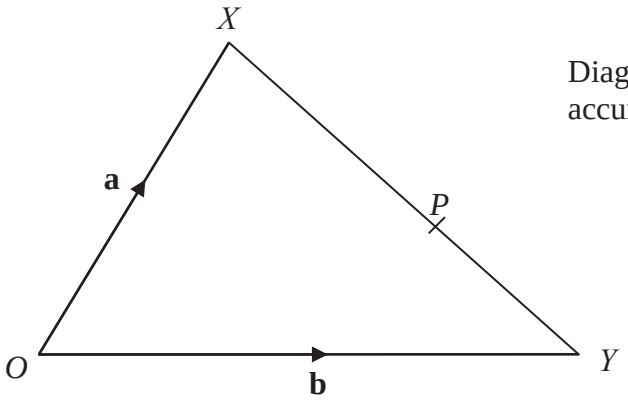


Diagram **NOT** accurately drawn

OXY is a triangle.

$\overrightarrow{OX}$ = **a**

$\overrightarrow{OY}$ = **b**

(a) Find the vector $\overrightarrow{XY}$ in terms of **a** and **b**.

$\overrightarrow{XY}$ = ...

(1)

P is the point on XY such that $XP : PY = 3 : 2$

(b) Show that $\overrightarrow{OP} = \frac{1}{5}(2\mathbf{a} + 3\mathbf{b})$

(3)

(Total 4 marks)

7.

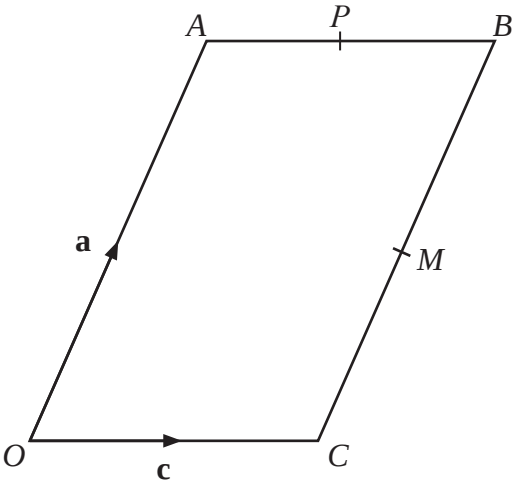


Diagram **NOT** accurately drawn

OABC is a parallelogram.
M is the midpoint of *CB*.
P is the midpoint of *AB*.

$\overrightarrow{OA} = \mathbf{a}$

$\overrightarrow{OC} = \mathbf{c}$

(a) Find, in terms of **a** and/or **c**, the vectors

(i) $\overrightarrow{MB}$,

.....

(ii) $\overrightarrow{MP}$.

.....

(2)

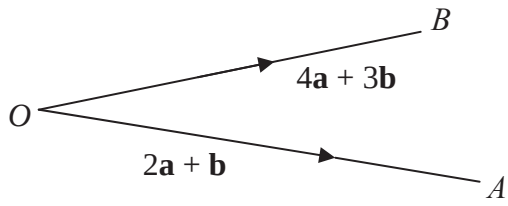
(b) Show that *CA* is parallel to *MP*.

(2)

(Total 4 marks)

8.

Diagram **NOT** accurately drawn



$\overrightarrow{OA} = 2\mathbf{a} + \mathbf{b}$

$\overrightarrow{OB} = 4\mathbf{a} + 3\mathbf{b}$

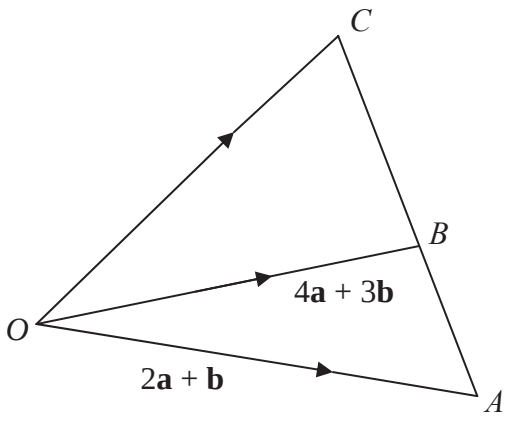
(a) Express the vector $\overrightarrow{AB}$ in terms of **a** and **b**

Give your answer in its simplest form.

.....

(2)

Diagram **NOT** accurately drawn



ABC is a straight line.
BC : *AB* = 3 : 2

(b) Express the vector $\overrightarrow{OC}$ in terms of **a** and **b**

Give your answer in its simplest form.

.....

(3)

(Total 5 marks)

9.

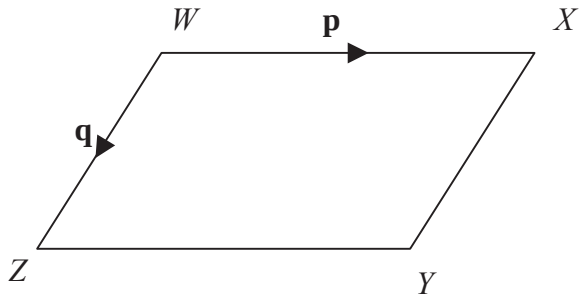


Diagram **NOT** accurately drawn

WXYZ is a parallelogram.
WX is parallel to *ZY*. *WZ* is parallel to *XY*.

$\overrightarrow{WX}$ = **p**

$\overrightarrow{AD}$ = **q**

(a) Express, in terms of **p** and **q**

(i) $\overrightarrow{WY}$

(i).....

(ii) $\overrightarrow{XZ}$

(ii).....

(2)

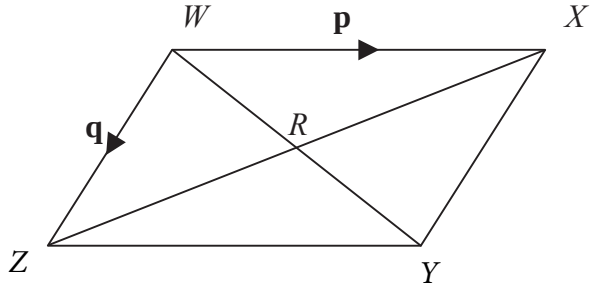


Diagram **NOT** accurately drawn

WX and *XZ* are diagonals of parallelogram *WXYZ*.
WY and *XZ* intersect at *R*

(b) Express $\overrightarrow{WR}$ in terms of **p** and **q**.

.....

(1)

(Total 3 marks)

10.

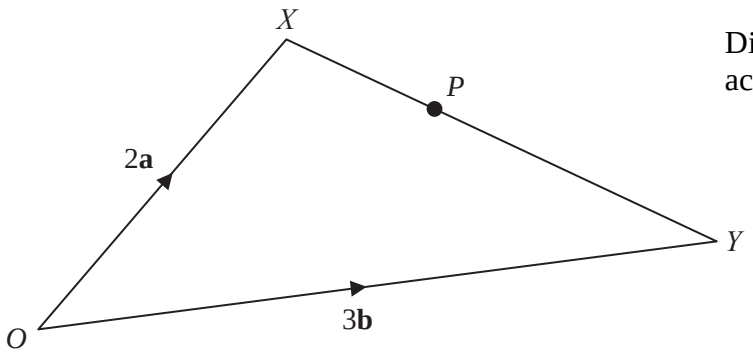


Diagram **NOT** accurately drawn

OXY is a triangle.

$\overrightarrow{OX} = 2\mathbf{a}$

$\overrightarrow{OY} = 3\mathbf{b}$

(a) Find $\overrightarrow{XY}$ in terms of **a** and **b**.

$\overrightarrow{XY}$ = ...

(1)

P is the point on *XY* such that *XP* : *PY* = 2 : 3

(b) Show that $\overrightarrow{OP}$ is parallel to the vector **a** + **b**

(3)

(Total 4 marks)