EXAM PAPERS PRACTICE

GCSE Edexcel Math

1MA1
Vectors

Question Paper

"We will help you to achieve A Star "
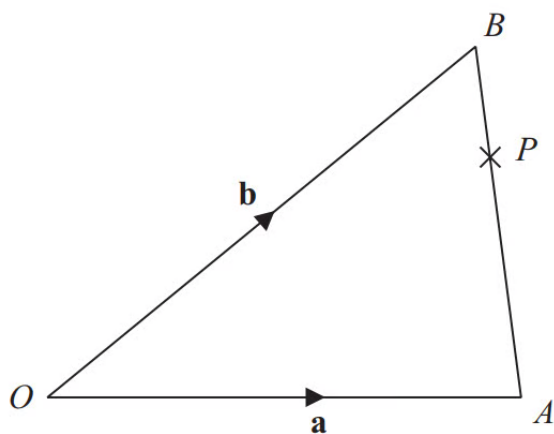
Question 1

Diagram **NOT**
accurately drawn

OAB is a triangle.

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

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

(a) Find $\overrightarrow{AB}$ in terms of $\mathbf{a}$ and $\mathbf{b}$.
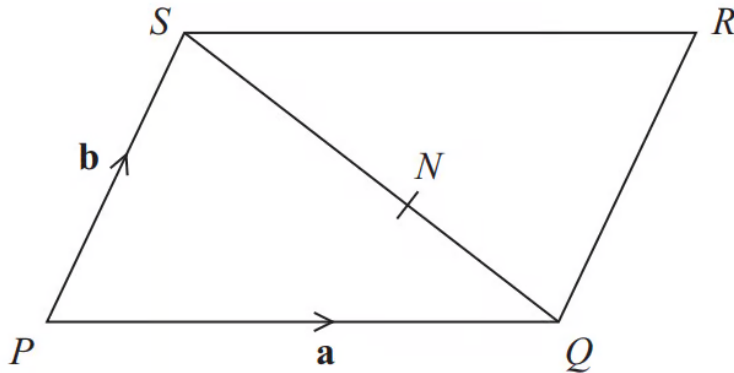
[1 mark]

Question 2

Diagram **NOT** accurately drawn

PQRS is a parallelogram.
N is the point on *SQ* such that *SN* : *NQ* = 3 : 2
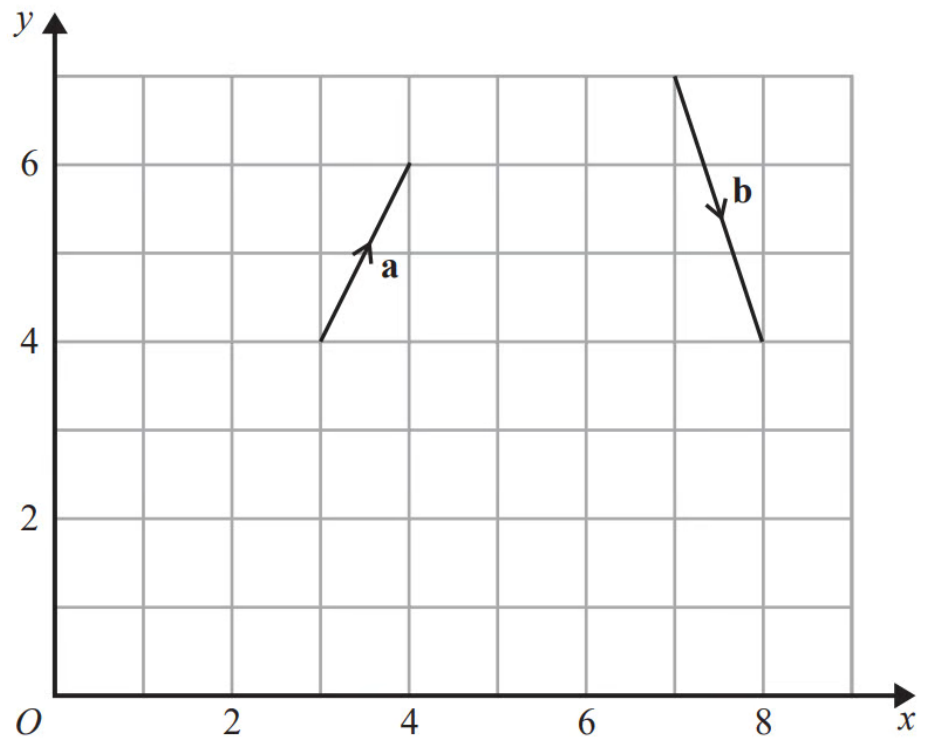$\overrightarrow{PQ} = \mathbf{a}$
$\overrightarrow{PS} = \mathbf{b}$

(a) Write down, in terms of **a** and **b**, an expression for $\overrightarrow{SQ}$.
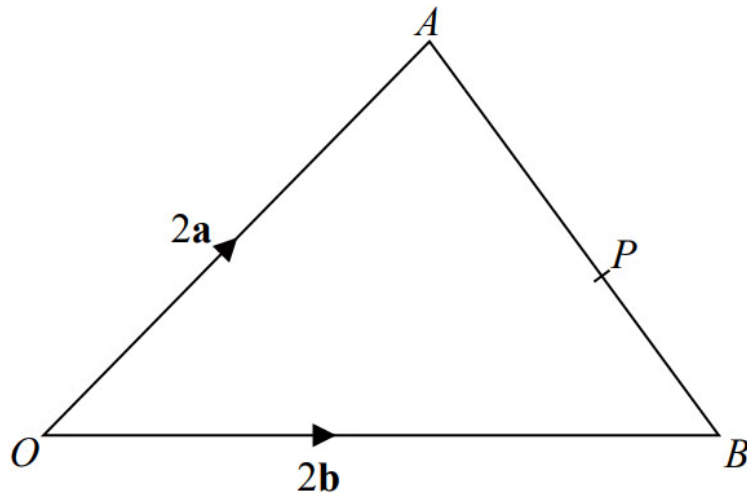
[1 mark]

Question 3

The vector **a** and the vector **b** are shown on the grid.

(a) On the grid, draw and label vector −2**a**

[1 mark]

Question 4

OAB is a triangle.
P is the point on AB such that $AP:PB = 5:3$

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

$\overrightarrow{OB} = 2\mathbf{b}$

$\overrightarrow{OP} = k(3\mathbf{a} + 5\mathbf{b})$ where k is a scalar quantity.

Find the value of k.

[4 marks]

Question 5

P is the point on AB such that $AP : PB = 3 : 1$

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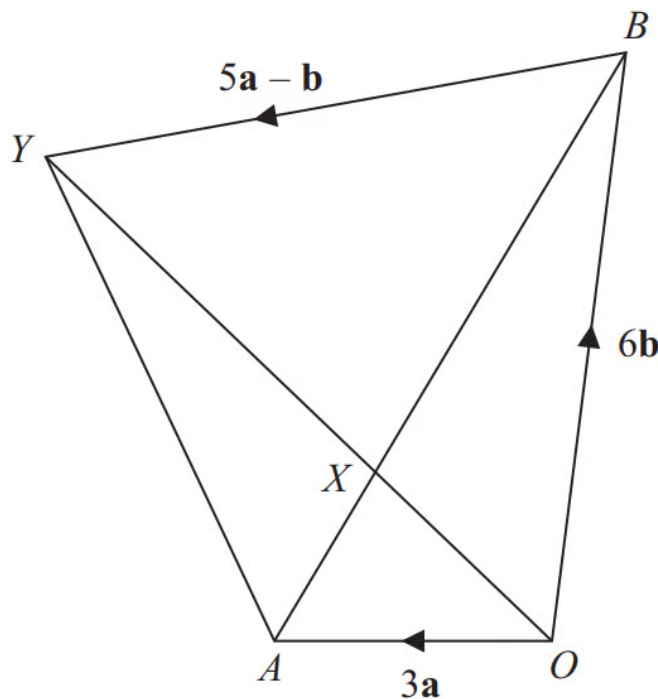Give your answer in its simplest form.

[3 marks]

Question 6

Diagram **NOT** accurately drawn

$OAYB$ is a quadrilateral.

$\overrightarrow{OA} = 3\mathbf{a}$

$\overrightarrow{OB} = 6\mathbf{b}$

(a) Express $\overrightarrow{AB}$ in terms of $\mathbf{a}$ and $\mathbf{b}$.

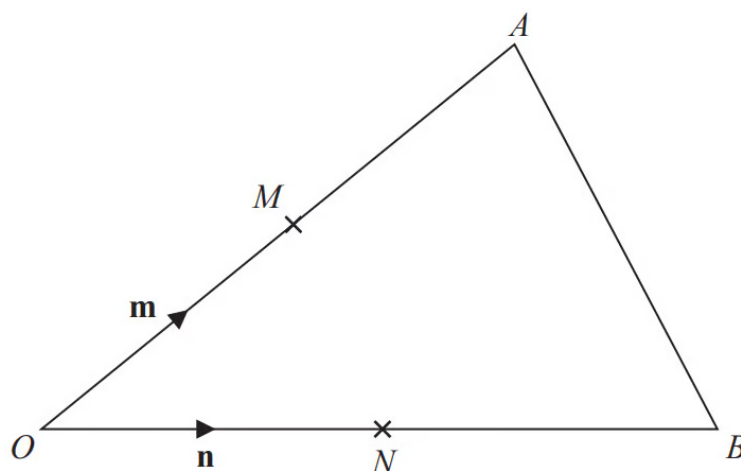[1 mark]

Question 7

Diagram **NOT** accurately drawn

OAB is a triangle.

M is the midpoint of *OA*.

N is the midpoint of *OB*.

$\overrightarrow{OM} = \mathbf{m}$

$\overrightarrow{ON} = \mathbf{n}$

Show that *AB* is parallel to *MN*.

[3 marks]

Question 8

S is the point on *PR* such that *PS* : *SR* = 1 : 3

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

[2 marks]

Question 9
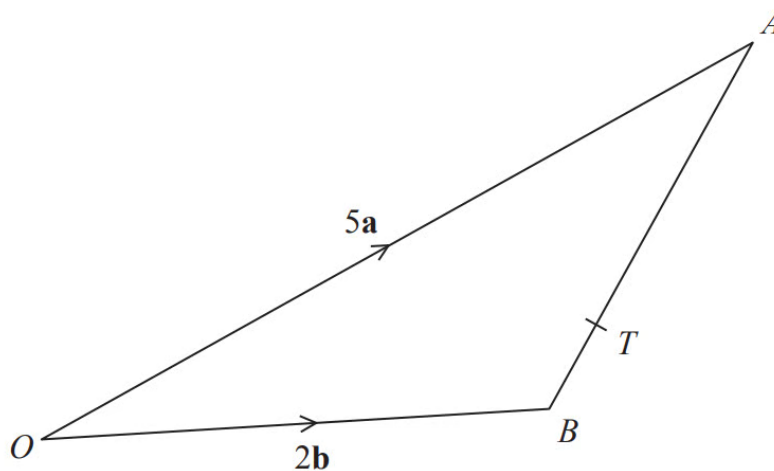
Diagram **NOT** accurately drawn

OAB is a triangle.

$\overrightarrow{OA} = 5\mathbf{a}$

$\overrightarrow{OB} = 2\mathbf{b}$

T is the point on *AB* such that *AT* : *TB* = 5 : 1

Show that *OT* is parallel to the vector **a** + 2**b**

[4 marks]

Question 10

N is the midpoint of OB.
G is the point on OM such that $OG : GM = 2 : 1$

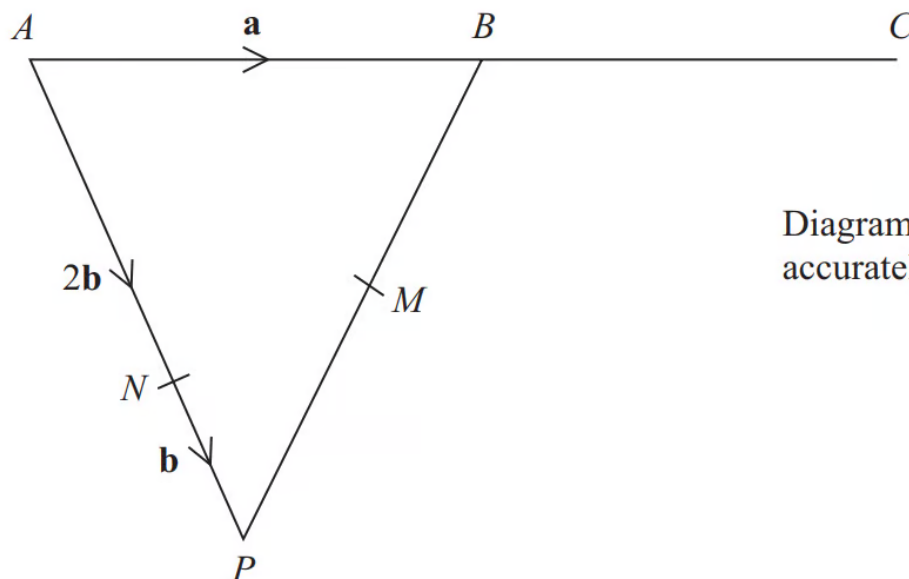*(b) Show that AGN is a straight line.

[4 marks]

Question 11

Diagram **NOT** accurately drawn

APB is a triangle.
N is a point on AP.

$$\overrightarrow{AB} = \mathbf{a} \qquad \overrightarrow{AN} = 2\mathbf{b} \qquad \overrightarrow{NP} = \mathbf{b}$$

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

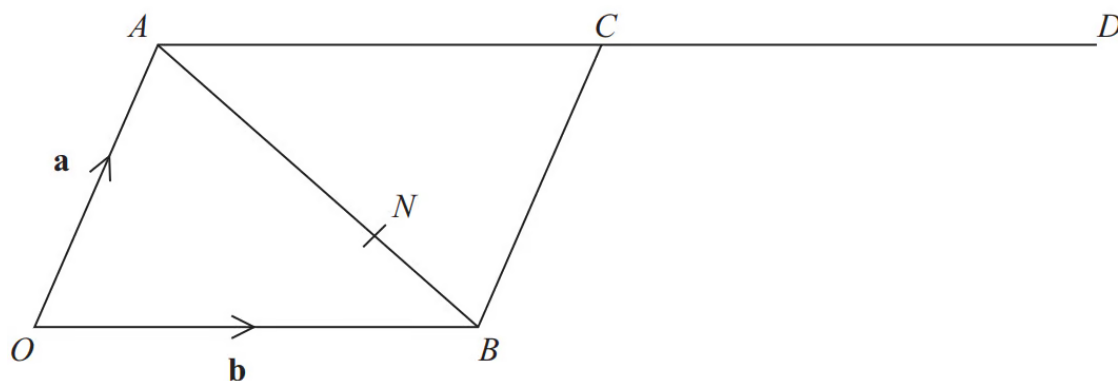[1 mark]

Question 12

$OACB$ is a parallelogram.

Diagram **NOT** accurately drawn

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

D is the point such that $\overrightarrow{AC} = \overrightarrow{CD}$

The point N divides AB in the ratio $2:1$

(a) Write an expression for $\overrightarrow{ON}$ in terms of $\mathbf{a}$ and $\mathbf{b}$.
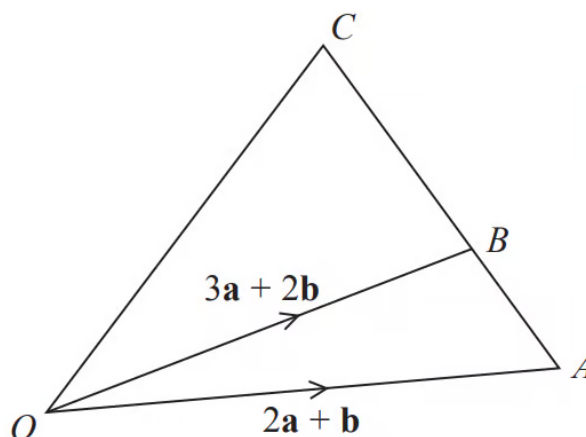
[3 marks]

Question 13

Diagram **NOT** accurately drawn

ABC is a straight line.

$AB : BC = 2 : 5$

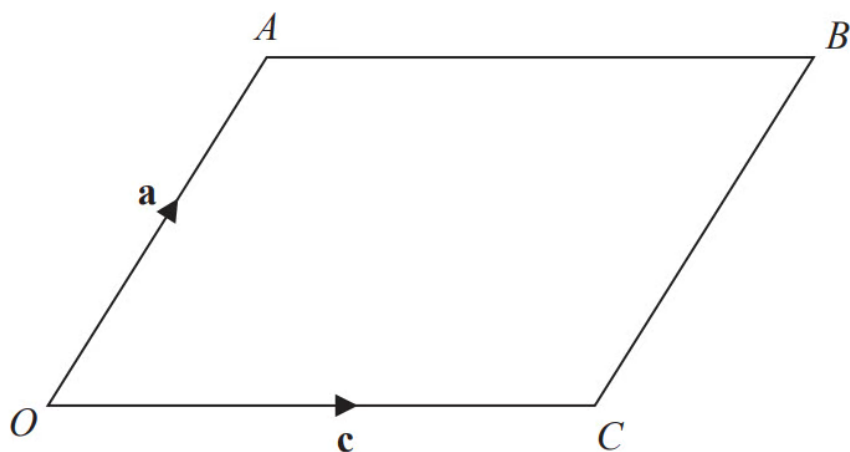$\overrightarrow{OA} = 2\mathbf{a} + \mathbf{b}$

$\overrightarrow{OB} = 3\mathbf{a} + 2\mathbf{b}$

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

[4 marks]

Question 14

$OABC$ is a parallelogram.

$\overrightarrow{OA} = \mathbf{a}$ and $\overrightarrow{OC} = \mathbf{c}$
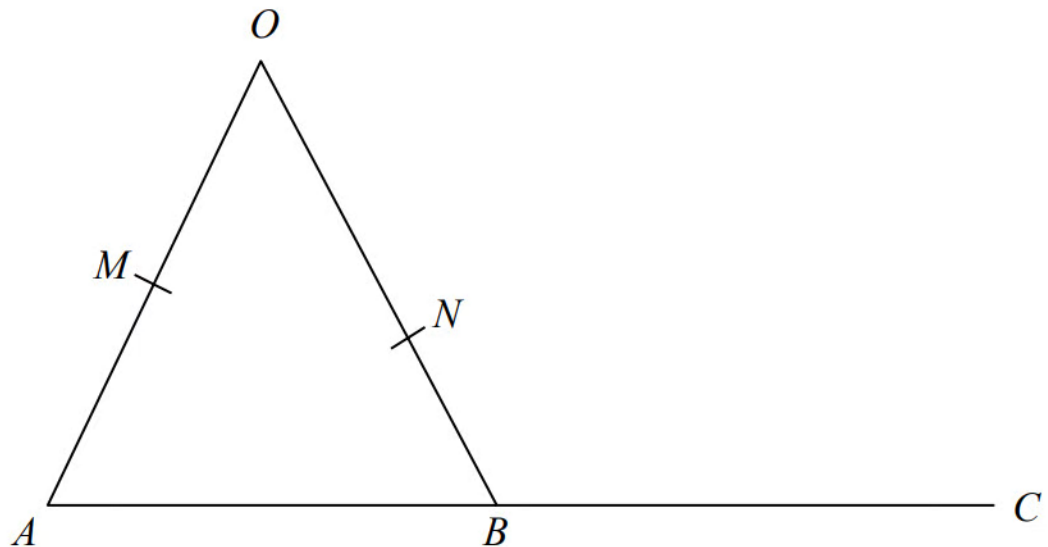
X is the midpoint of the line AC.
OCD is a straight line so that $OC : CD = k : 1$

Given that $\overrightarrow{XD} = 3\mathbf{c} - \dfrac{1}{2}\mathbf{a}$

find the value of k.

[4 marks]

Question 15

OMA, ONB and ABC are straight lines.
M is the midpoint of OA.
B is the midpoint of AC.
$\overrightarrow{OA} = 6\mathbf{a}$ $\overrightarrow{OB} = 6\mathbf{b}$ $\overrightarrow{ON} = k\mathbf{b}$ where k is a scalar quantity.

Given that MNC is a straight line, find the value of k.

[5 marks]