1 GCSE VECTORS

26

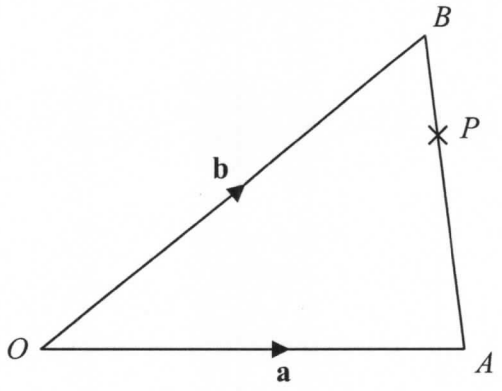

Diagram **NOT** accurately drawn

OAB is a triangle.

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

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

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

.....

(1)

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

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

.....

(3)

(Total for Question 26 is 4 marks)

TOTAL FOR PAPER IS 100 MARKS

GCSE VECTORS

28

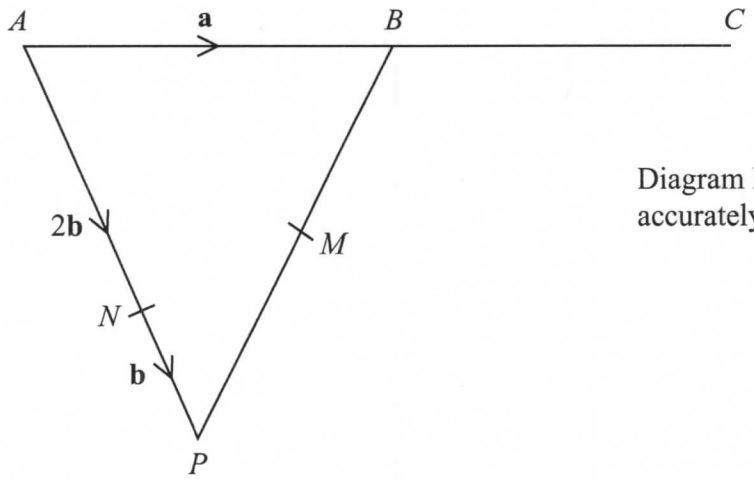

Diagram **NOT** accurately drawn

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

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

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

.....

(1)

B is the midpoint of *AC*.
M is the midpoint of *PB*.

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

(4)

(Total for Question 28 is 5 marks)

TOTAL FOR PAPER IS 100 MARKS

3 GCSE VECTORS

26

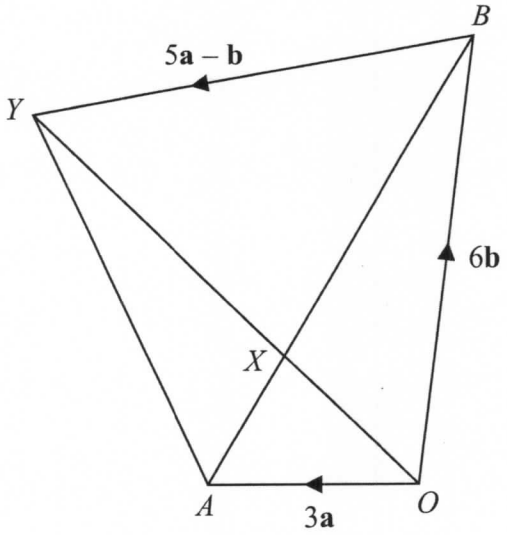

Diagram **NOT** accurately drawn

OAYB is a quadrilateral.

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

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

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

.....

(1)

X is the point on *AB* such that $AX : XB = 1 : 2$

and $\overrightarrow{BY} = 5\mathbf{a} - \mathbf{b}$

*(b) Prove that $\overrightarrow{OX} = \frac{2}{5}\overrightarrow{OY}$

(4)

(Total for Question 26 is 5 marks)

TOTAL FOR PAPER IS 100 MARKS

4

GCSE VECTORS

27

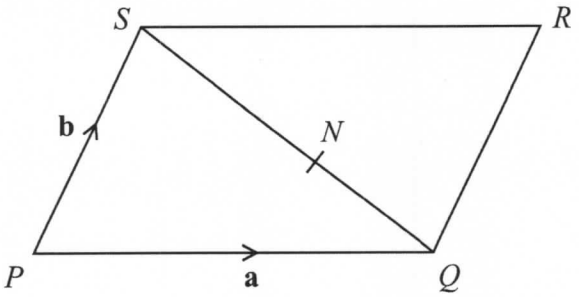

Diagram **NOT** accurately drawn

$PQRS$ 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 $\overrightarrow{SQ}$.

$\overrightarrow{SQ} =$ .....

(1)

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

$\overrightarrow{NR} =$ .....

(3)

(Total for Question 27 is 4 marks)

5

GCSE VECTORS

24 $OACB$ is a parallelogram.

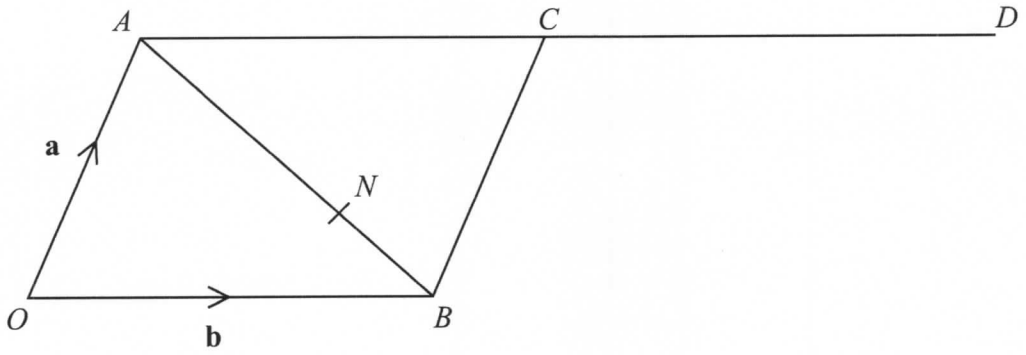

Diagram **NOT** accurately drawn

$\overrightarrow{OA} = \mathbf{a}$ 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 **a** and **b**.

.....

(3)

*(b) Prove that OND is a straight line.

(3)

(Total for Question 24 is 6 marks)

TOTAL FOR PAPER IS 100 MARKS

GCSE VECTORS

***24**

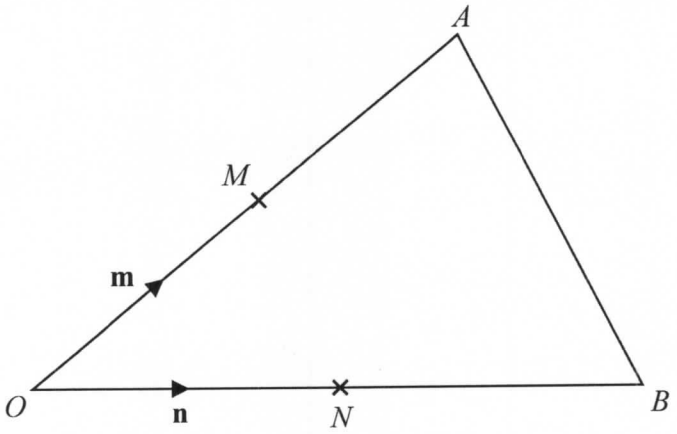

Diagram **NOT** accurately drawn

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*.

(Total for Question 24 is 3 marks)

7 GCSE VECTORS

27

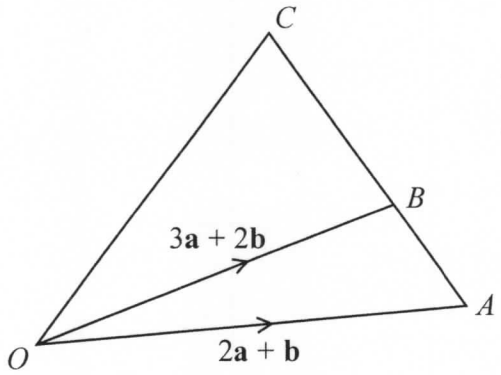

Diagram **NOT** accurately drawn

ABC is a straight line.

$AB : BC = 2 : 5$

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

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

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

.....

(Total for Question 27 is 4 marks)

8

GCSE VECTORS

***20**

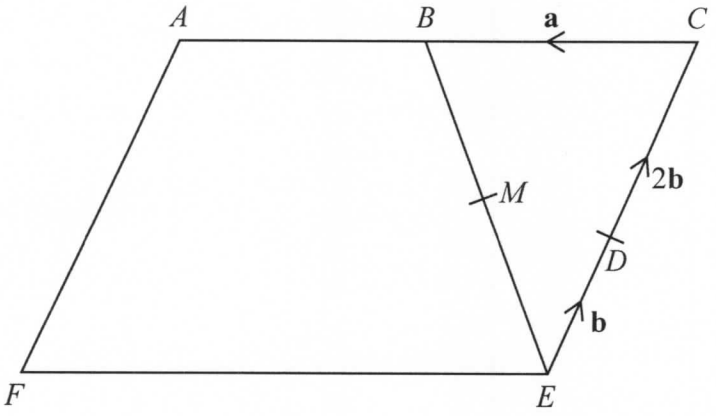

Diagram **NOT** accurately drawn

ACEF is a parallelogram.
B is the midpoint of *AC*.
M is the midpoint of *BE*.

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

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

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

Show that *AMD* is a straight line.

(Total for Question 20 is 5 marks)

9

GCSE VECTORS

23

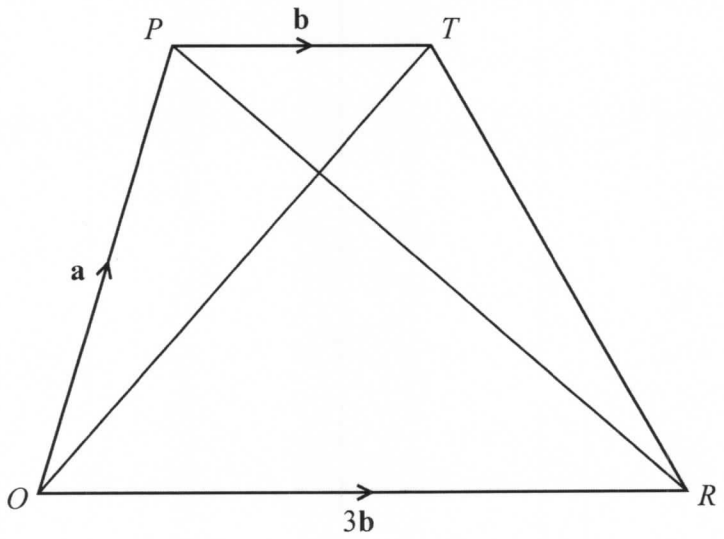

Diagram **NOT** accurately drawn

OPTR is a trapezium.

$\overrightarrow{OP} = \mathbf{a}$
$\overrightarrow{PT} = \mathbf{b}$
$\overrightarrow{OR} = 3\mathbf{b}$

(a) (i) Find $\overrightarrow{OT}$ in terms of **a** and **b**

.....

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

.....

(2)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

GCSE VECTORS

23

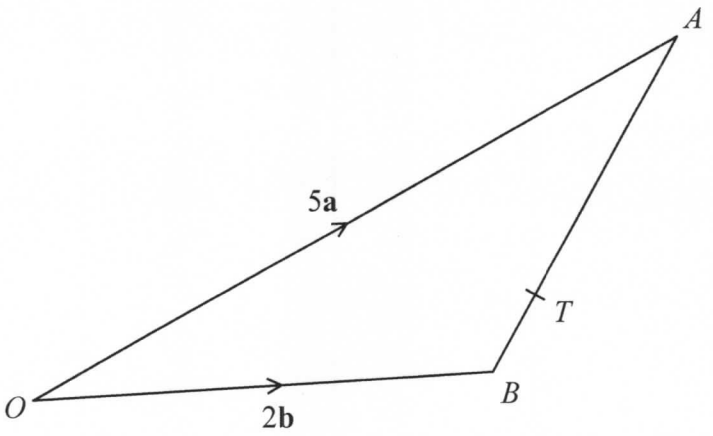

Diagram **NOT** accurately drawn

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 $\mathbf{a} + 2\mathbf{b}$

(Total for Question 23 is 4 marks)