1.

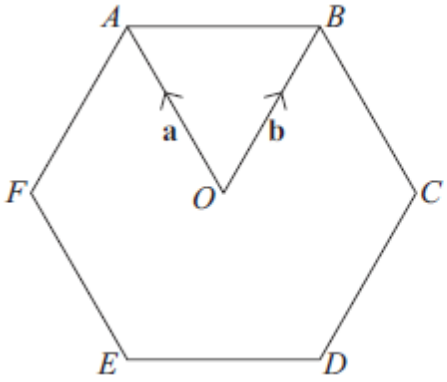

Diagram **NOT** accurately drawn

ABCDEF is a regular hexagon, with centre *O*.

$\overrightarrow{OA} = \mathbf{a}$, $\overrightarrow{OB} = \mathbf{b}$.

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

.....

(1)

The line *AB* is extended to the point *K* so that *AB* : *BK* = 1 : 2

(b) Write the vector $\overrightarrow{CK}$ in terms of **a** and **b**.
Give your answer in its simplest form.

.....

(3)

(4 marks)

2.

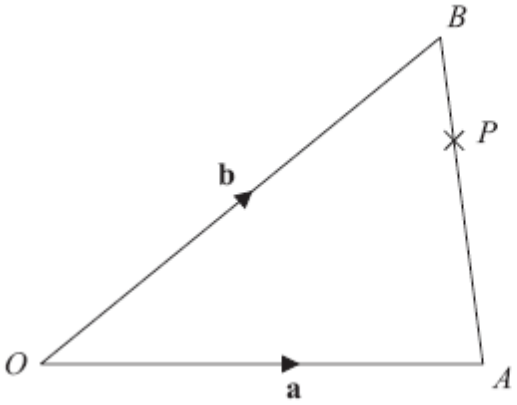

Diagram **NOT** accurately drawn

OAB is a triangle.

$\overrightarrow{OA}$ = **a**
$\overrightarrow{OB}$ = **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)

(4 marks)

3.

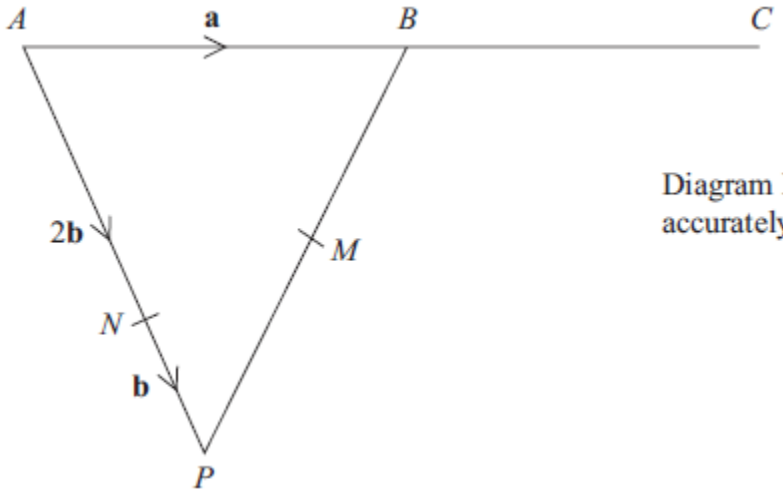

Diagram **NOT** accurately drawn

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)

(5 marks)

4.

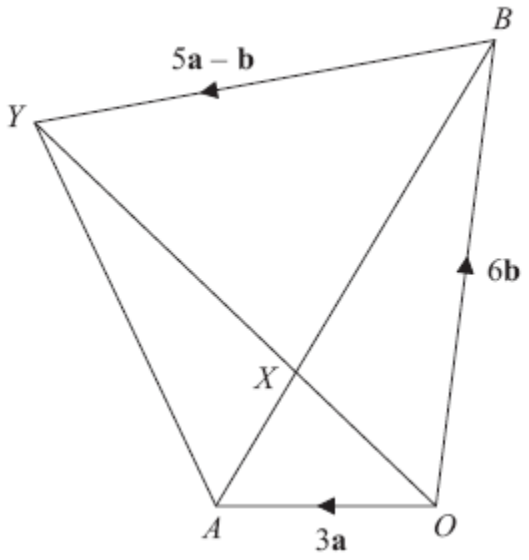

Diagram **NOT** accurately drawn

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)

(5 marks)

5.

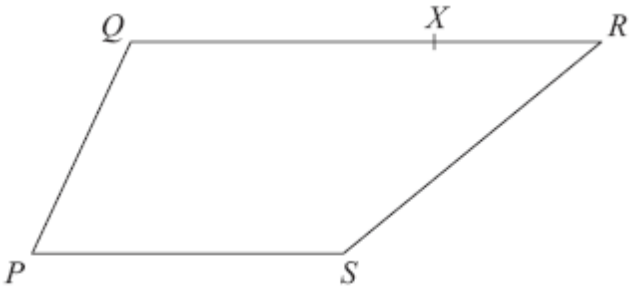

Diagram **NOT** accurately drawn

PQRS is a trapezium.
PS is parallel to *QR*.
QR = 2*PS*

$\overrightarrow{PQ}$ = **a** $\overrightarrow{PS}$ = **b**

X is the point on *QR* such that *QX* : *XR* = 3 : 1

Express in terms of **a** and **b**.

(i) $\overrightarrow{PR}$

(2)

.....

(ii) $\overrightarrow{SX}$

(3)

.....

(5 marks)

6.

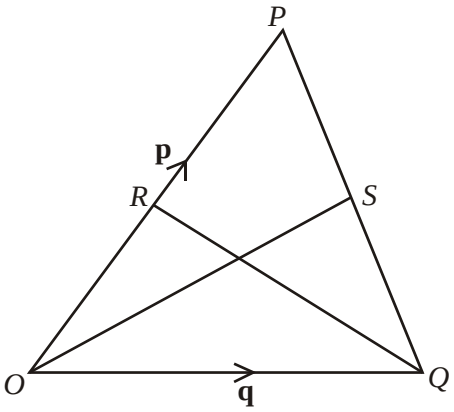

Diagram **NOT** accurately drawn

OPQ is a triangle.

R is the midpoint of *OP*.

S is the midpoint of *PQ*.

$\overrightarrow{OP} = p$ and $\overrightarrow{OQ} = q$

(i) Find $\overrightarrow{OS}$ in terms of *p* and *q*.

$\overrightarrow{OS}$ = ...

(ii) Show that *RS* is parallel to *OQ*.

(5 marks)

6.

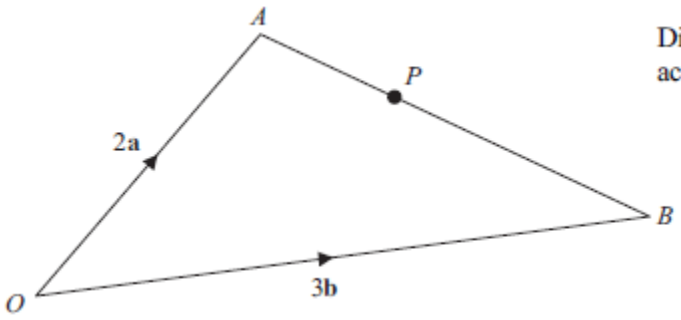

Diagram **NOT** accurately drawn

OAB is a triangle.

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

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

(*a*) Find *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 **a** + **b**.

(3)

(4 marks)