

1.

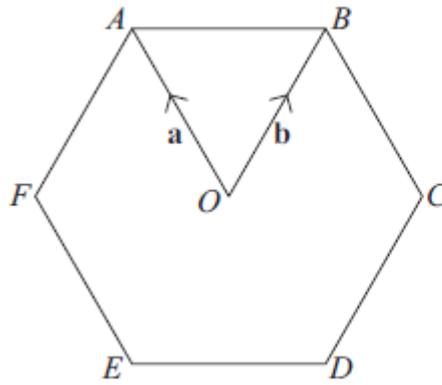


Diagram NOT
accurately drawn

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

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

(a) Write the vector \vec{AB} in terms of \mathbf{a} and \mathbf{b} .

.....
(1)

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

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

.....
(3)

(4 marks)

2.

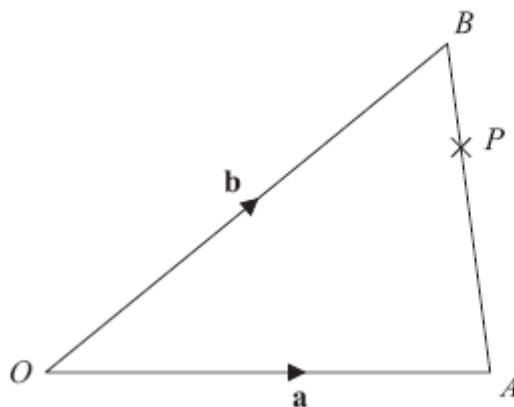


Diagram **NOT**
accurately drawn

OAB is a triangle.

$$\vec{OA} = \mathbf{a}$$
$$\vec{OB} = \mathbf{b}$$

(a) Find \vec{AB} in terms of \mathbf{a} and \mathbf{b} .

.....
(1)

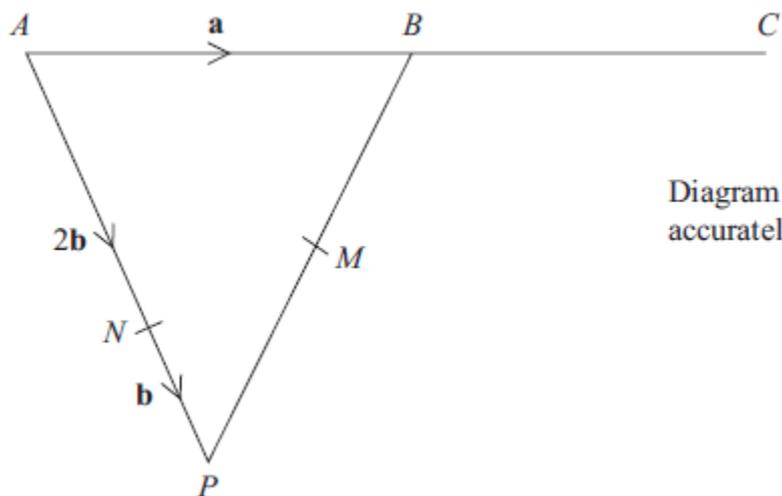
P is the point on AB such that $AP : PB = 3 : 1$

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

.....
(3)

(4 marks)

3.



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)

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

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

(4)

(5 marks)

4.

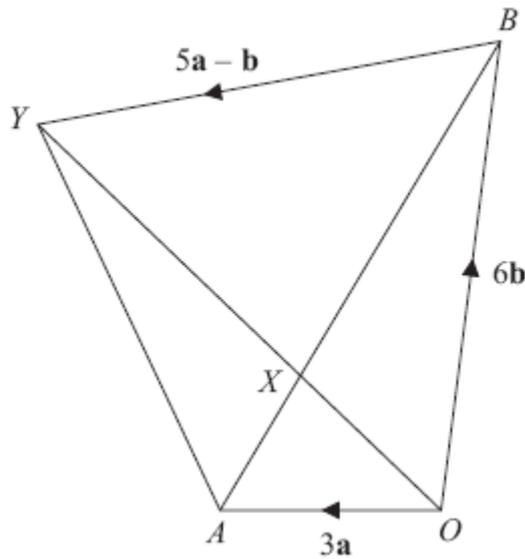


Diagram NOT
accurately drawn

$OAYB$ is a quadrilateral.

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

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

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

.....
(1)

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

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

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

(4)

(5 marks)

5.

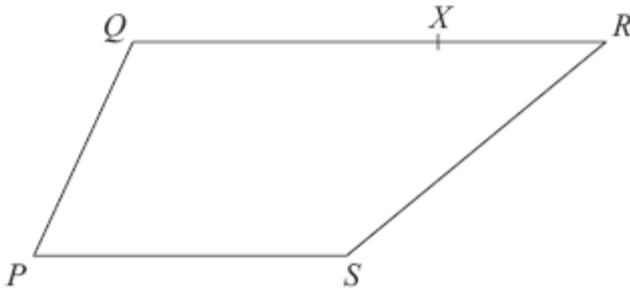


Diagram **NOT** accurately drawn

$PQRS$ is a trapezium.

PS is parallel to QR .

$QR = 2PS$

$\vec{PQ} = \mathbf{a}$ $\vec{PS} = \mathbf{b}$

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

Express in terms of \mathbf{a} and \mathbf{b} .

(i) \vec{PR}

(2)

.....

(ii) \vec{SX}

(3)

.....

(5 marks)

6.

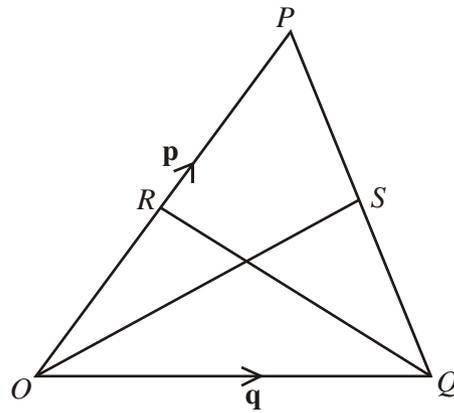


Diagram **NOT**
accurately drawn

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 .

$\overrightarrow{OS} = \dots\dots\dots$

(ii) Show that RS is parallel to OQ .

(5 marks)

6.

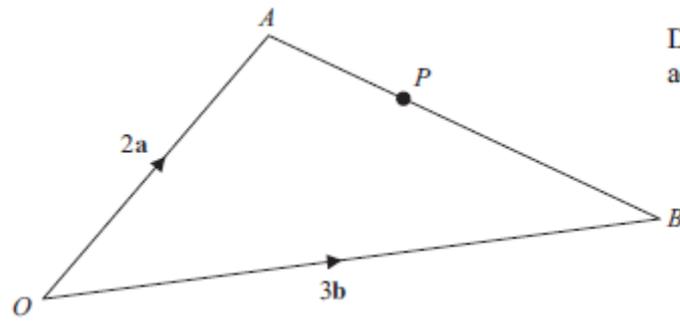


Diagram NOT accurately drawn

OAB is a triangle.

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

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

(a) Find AB in terms of \mathbf{a} and \mathbf{b} .

$$\vec{AB} = \dots\dots\dots (1)$$

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

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

(3)

(4 marks)