Chapter 1

GCSE Revision Questions - Vectors

1.

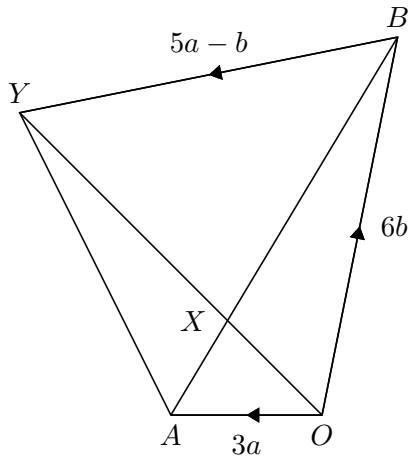

Diagram **NOT** accurately drawn

OAYB is a quadrilateral. $\overline{OA} = 3\mathbf{a}$ and $\overline{OB} = 6\mathbf{b}$.

(a) Express $\overline{AB}$ in terms of **a** and **b**. **(1)**

X is the point on AB such that $AX : XB = 1 : 2$ and $\overline{BY} = 5\mathbf{a} - \mathbf{b}$.

(b) Prove that $\overline{OX} = \frac{2}{5}\overline{OY}$. **(1)**

2.

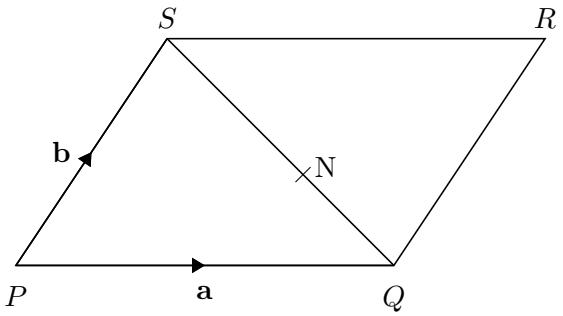

Diagram **NOT** accurately drawn

PQRS is a parallelogram. N is the point on SQ such that $SN : NQ = 3 : 2$

$\overline{PQ} = \mathbf{a}$

$\overline{PS} = \mathbf{b}$

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

$\overline{SQ}$ .....

(b) Express $\overline{NR}$ in terms of **a** and **b**. **(3)**

$\overline{NR}$ .....

3.

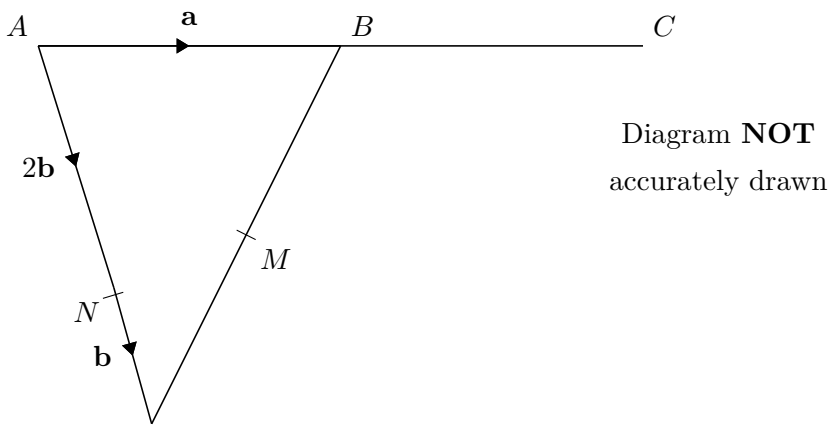

Diagram **NOT** accurately drawn

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

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

(a) Find the vector ,$\overline{PB}$ in terms of **a** and **b**. **(1)**

(b) B is the midpoint of AC. M is the midpoint of PB. Show that NMC is a straight line.

(4)

4.

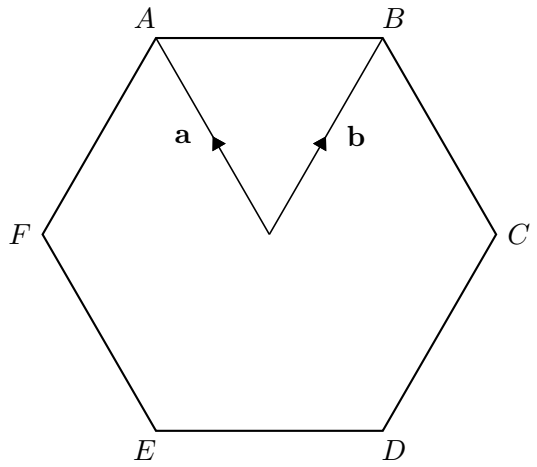

Diagram **NOT** accurately drawn

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

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

(a) Write the vector $\overline{AB}$ in terms of $\mathbf{a}$ and $\mathbf{b}$. **(1)**

(b) The line AB is extended to the point K so that $AB : BK = 1 : 2$. Write the vector $\overline{CK}$ in terms of $\mathbf{a}$ and $\mathbf{b}$. Give your answer in its simplest form.. **(3)**

5.

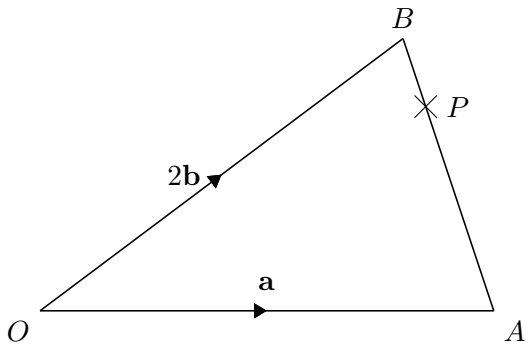

Diagram **NOT** accurately drawn

OAB is a triangle. $\overline{OA} = \mathbf{a}$, $\overline{OB} = \mathbf{b}$.

(a) Find $\overline{AB}$ in terms of $\mathbf{a}$ and $\mathbf{b}$. **(1)**

(b) P is the point on AB such that $AP : PB = 3 : 1$. Find $\overline{OP}$ in terms of $\mathbf{a}$ and $\mathbf{b}$. Give your answer in its simplest form. **(3)**

6.

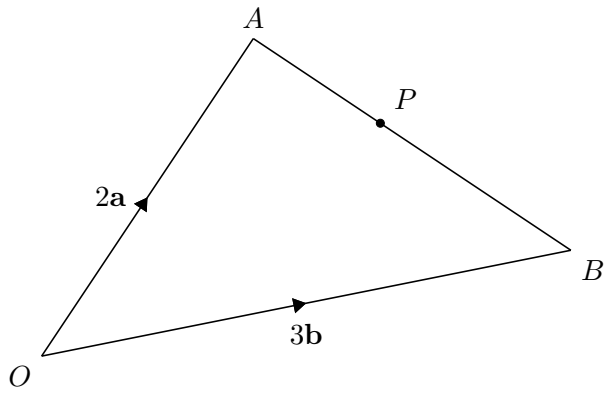

Diagram **NOT** accurately drawn

OAB is a triangle. $\overline{OA} = 2\mathbf{a}$, $\overline{OB} = 3\mathbf{b}$.

(a) Find AB in terms of $\mathbf{a}$ and $\mathbf{b}$. **(1)**

$\overline{AB} =$ .....

(b) P is the point on AB such that $AP : PB = 2 : 3$. Show that $\overline{OP}$ is parallel to the vector $\mathbf{a} + \mathbf{b}$. **(3)**

7.

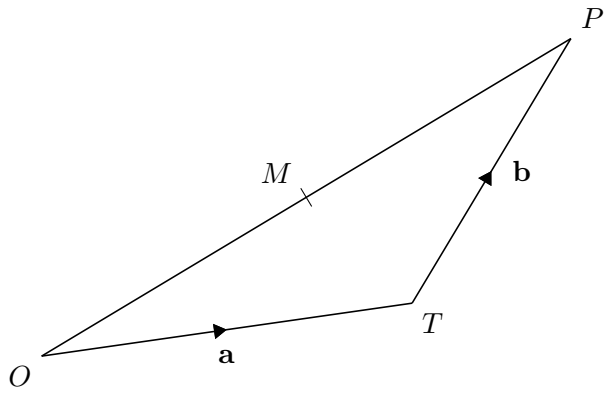

Diagram **NOT** accurately drawn

OPT is a triangle. M is the midpoint of OP.

$\overline{OT} = \mathbf{a}$, $\overline{TP} = \mathbf{b}$.

(a) Express $\overline{OM}$ in terms of $\mathbf{a}$ and $\mathbf{b}$. **(2)**

$\overline{OM}$ =.....

(b) Express $\overline{TM}$ in terms of $\mathbf{a}$ and $\mathbf{b}$. Give your answer in its simplest form. **(2)**

$\overline{OM}$ =.....

8.

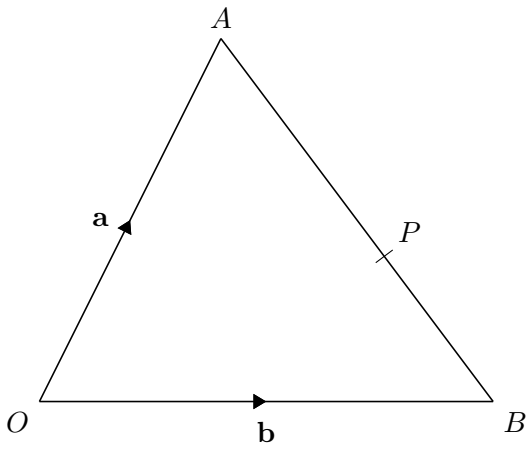

Diagram **NOT** accurately drawn

OAB is a triangle. $\overline{OA} = \mathbf{a}$, $\overline{OB} = \mathbf{b}$.

(a) Find the vector $\overline{AB}$ in terms of $\mathbf{a}$ and $\mathbf{b}$. **(1)**

$\overline{AB} =$ .....

(b) P is the point on AB such that $AP : PB = 3 : 2$. Show that $\overline{OP} = \frac{1}{5}(2\mathbf{a} + 3\mathbf{b})$. **(3)**