

# Vectors

## Question Paper

Level	GCSE
Subject	Maths
Exam Board	Edexcel GCSE
Topic	Vectors
Grade Level	Grade 7
Booklet	Question Paper

**Time Allowed:** 39 minutes

**Score:** /32

**Percentage:** /100

**Grade Boundaries:**

1.

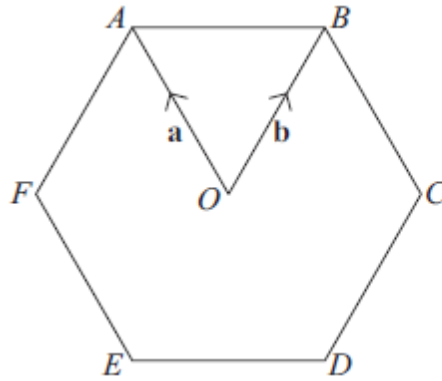


Diagram NOT  
accurately drawn

$ABCDEF$  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.

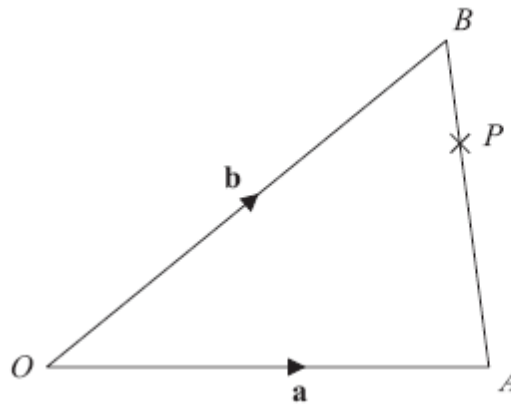


Diagram **NOT**  
accurately drawn

$OAB$  is a triangle.

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

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

.....  
(1)

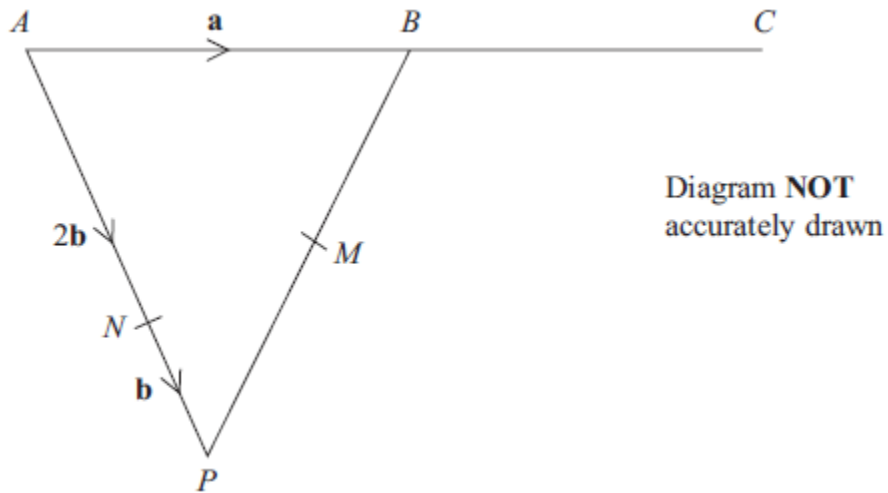
$P$  is the point on  $AB$  such that  $AP : PB = 3 : 1$

(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)

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4.

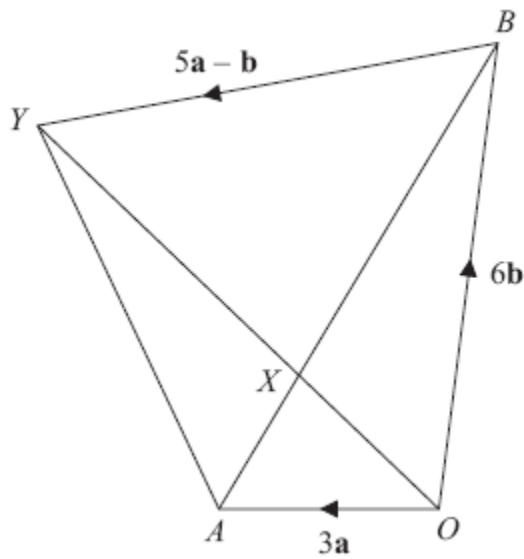


Diagram NOT  
accurately drawn

$OAYB$  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)

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5.

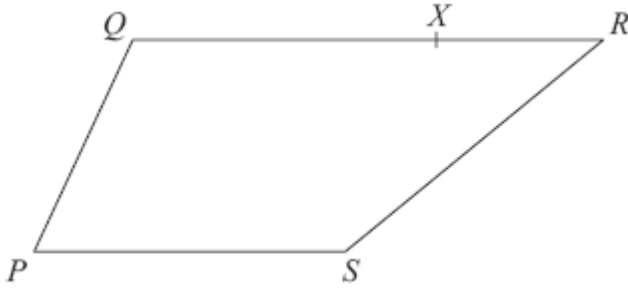


Diagram **NOT**  
accurately drawn

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

$$\overrightarrow{PQ} = \mathbf{a} \quad \overrightarrow{PS} = \mathbf{b}$$

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

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

(i)  $\overrightarrow{PR}$

(2)

.....

(ii)  $\overrightarrow{SX}$

(3)

.....

**(5 marks)**

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6.

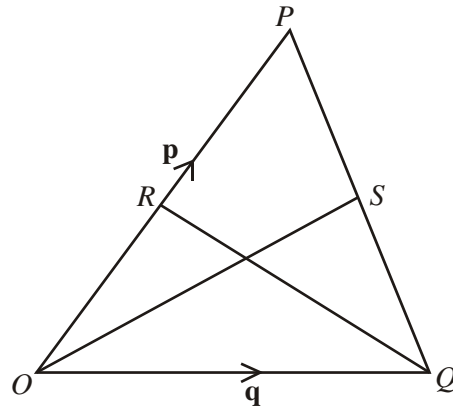


Diagram **NOT**  
accurately drawn

$OPQ$  is a triangle.

$R$  is the midpoint of  $OP$ .

$S$  is the midpoint of  $PQ$ .

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

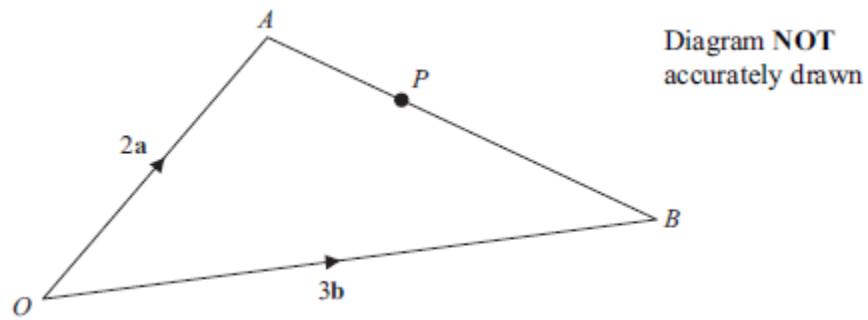
(i) Find  $\vec{OS}$  in terms of  $p$  and  $q$ .

$\vec{OS} = \dots\dots\dots$

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

**(5 marks)**

6.



$OAB$  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)**

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