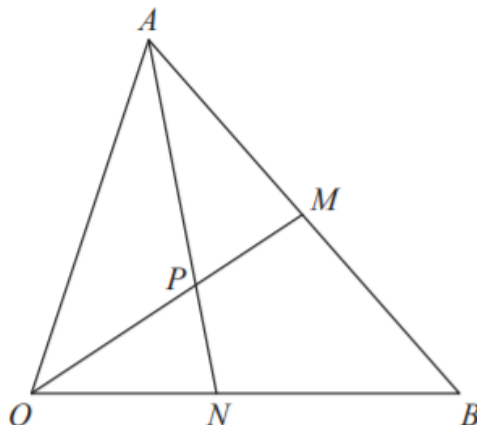


**Vectors Past Paper Questions GCSE Edexcel – Non Calculator**

1.



$OAB$  is a triangle.

$OPM$  and  $APN$  are straight lines.

$M$  is the midpoint of  $AB$ .

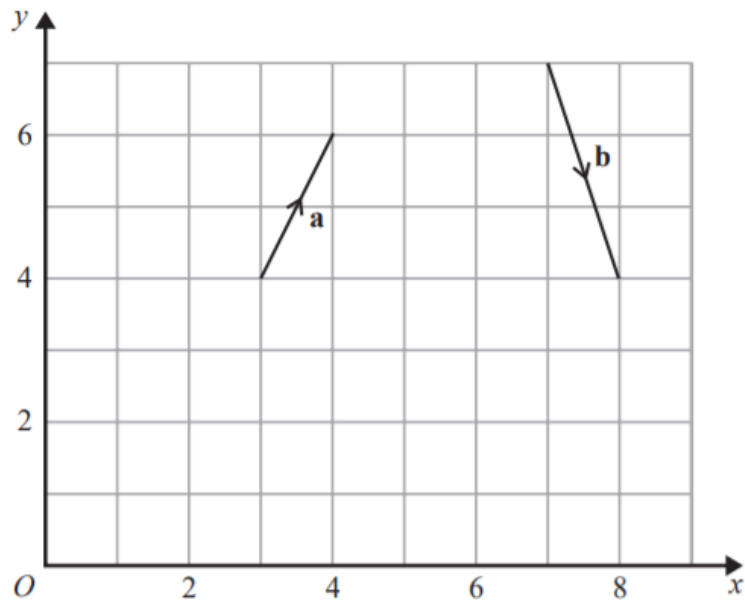
$$\vec{OA} = \mathbf{a} \quad \vec{OB} = \mathbf{b}$$

$$OP : PM = 3 : 2$$

Work out the ratio  $ON : NB$

2.

The vector **a** and the vector **b** are shown on the grid.



(a) On the grid, draw and label vector  $-2\mathbf{a}$

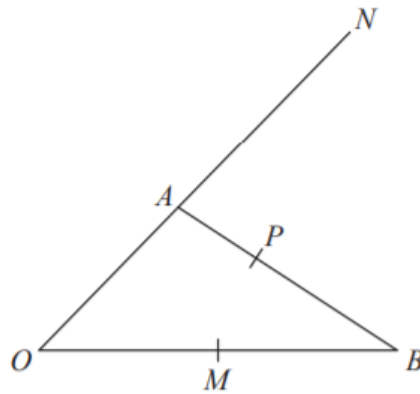
(1)

(b) Work out  $\mathbf{a} + 2\mathbf{b}$  as a column vector.

$$\begin{pmatrix} \phantom{0} \\ \text{---} \\ \phantom{0} \end{pmatrix}$$

(2)

3.



$OAN$ ,  $OMB$  and  $APB$  are straight lines.

$AN = 2OA$ .

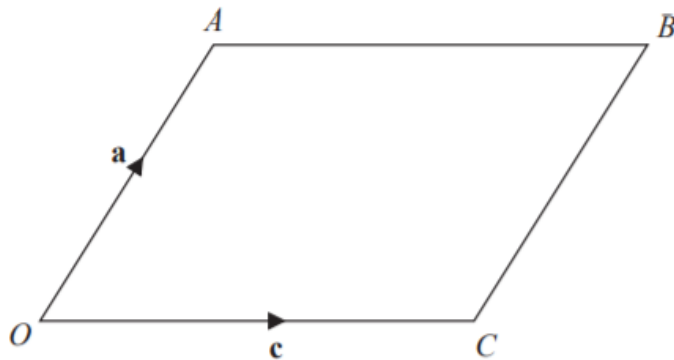
$M$  is the midpoint of  $OB$ .

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

$\vec{AP} = k\vec{AB}$  where  $k$  is a scalar quantity.

Given that  $MPN$  is a straight line, find the value of  $k$ .

4.



$OACB$  is a parallelogram.

$$\vec{OA} = \mathbf{a} \text{ and } \vec{OC} = \mathbf{c}$$

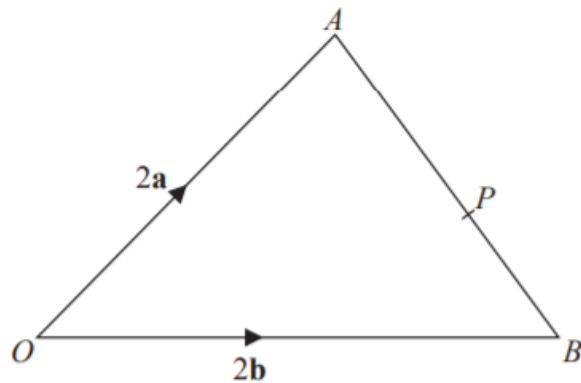
$X$  is the midpoint of the line  $AC$ .

$OCD$  is a straight line so that  $OC : CD = k : 1$

$$\text{Given that } \vec{XD} = 3\mathbf{c} - \frac{1}{2}\mathbf{a}$$

find the value of  $k$ .

5.



$OAB$  is a triangle.

$P$  is the point on  $AB$  such that  $AP : PB = 5 : 3$

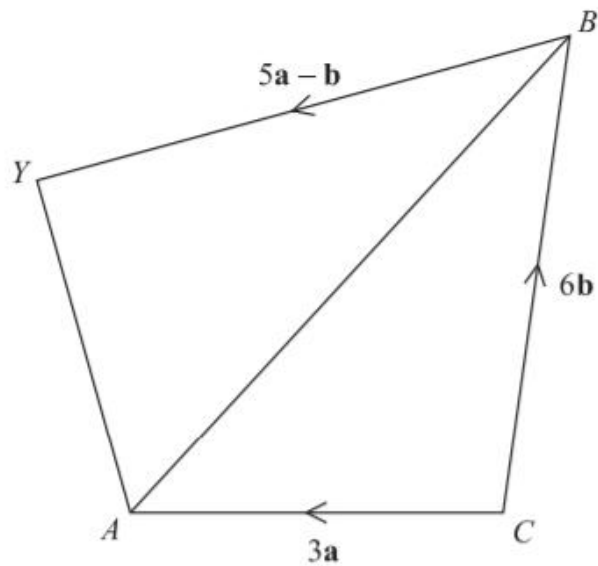
$$\vec{OA} = 2\mathbf{a}$$

$$\vec{OB} = 2\mathbf{b}$$

$$\vec{OP} = k(3\mathbf{a} + 5\mathbf{b}) \text{ where } k \text{ is a scalar quantity.}$$

Find the value of  $k$ .

6.



$CAYB$  is a quadrilateral.

$$\vec{CA} = 3\mathbf{a}$$

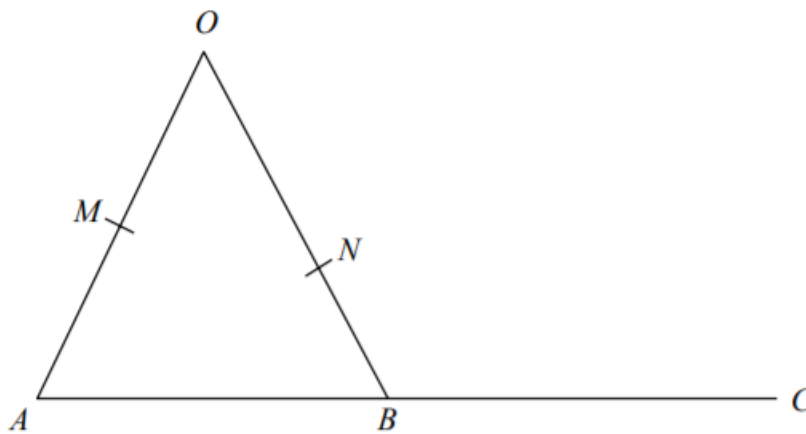
$$\vec{CB} = 6\mathbf{b}$$

$$\vec{BY} = 5\mathbf{a} - \mathbf{b}$$

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

Prove that  $\vec{CX} = \frac{2}{5}\vec{CY}$

7.



$OMA$ ,  $ONB$  and  $ABC$  are straight lines.

$M$  is the midpoint of  $OA$ .

$B$  is the midpoint of  $AC$ .

$\vec{OA} = 6\mathbf{a}$     $\vec{OB} = 6\mathbf{b}$     $\vec{ON} = k\mathbf{b}$  where  $k$  is a scalar quantity.

Given that  $MNC$  is a straight line, find the value of  $k$ .