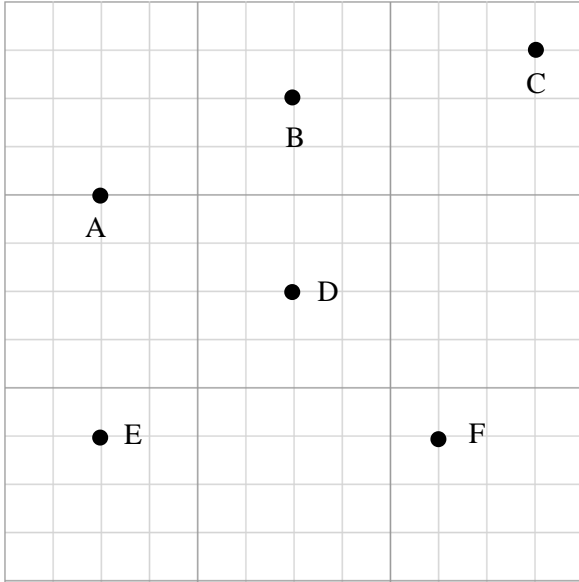


1. The diagram shows the location of points A to F.



Write down each of the following vectors in column vector form.

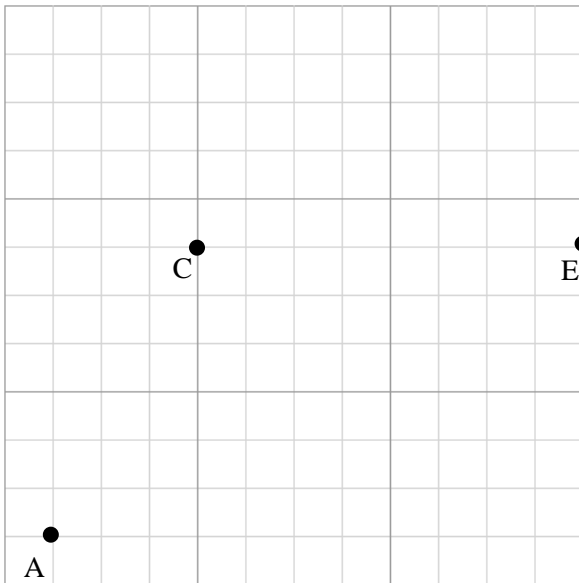
(i) $\overrightarrow{AB} = \begin{pmatrix} \\ \end{pmatrix}$

(ii) $\overrightarrow{BA} = \begin{pmatrix} \\ \end{pmatrix}$

(iii) $\overrightarrow{DE} = \begin{pmatrix} \\ \end{pmatrix}$

(iv) $\overrightarrow{BD} = \begin{pmatrix} \\ \end{pmatrix}$

2. $a = \begin{pmatrix} 3 \\ 4 \end{pmatrix}$, $b = \begin{pmatrix} 2 \\ -5 \end{pmatrix}$, $c = \begin{pmatrix} 0 \\ 4 \end{pmatrix}$



Draw and label the following resultant vectors

(i) $\overrightarrow{AB} = a + b$

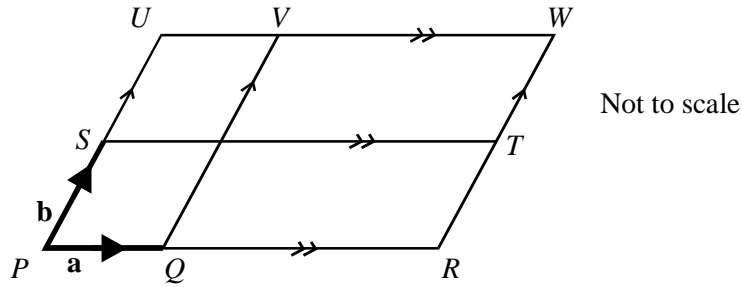
(ii) $\overrightarrow{CD} = c - a$

(iii) $\overrightarrow{EF} = -b - 2a$

3. The diagram shows two sets of parallel lines.

Vector $\vec{PQ} = \mathbf{a}$ and vector $\vec{PS} = \mathbf{b}$

$\vec{PR} = 3\vec{PQ}$ and $\vec{PU} = 2\vec{PS}$



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

.....

Answer

(1)

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

.....

Answer

(1)

(c) Find **two** vectors that can be written as $3\mathbf{a} - \mathbf{b}$

.....

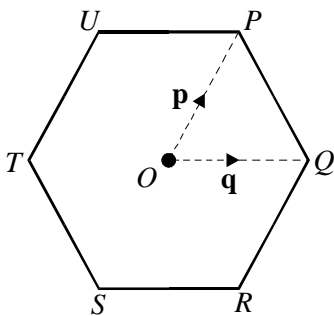
Answer and

(2)

(Total 4 marks)

4. $PQRSTU$ is a regular hexagon and O is the centre of the hexagon.

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



Express each of the following vectors in terms of \mathbf{p} and \mathbf{q}

(a) \vec{PQ}

.....

.....

Answer

(1)

(b) \vec{SP}

.....

Answer

(1)

(c) \vec{SQ}

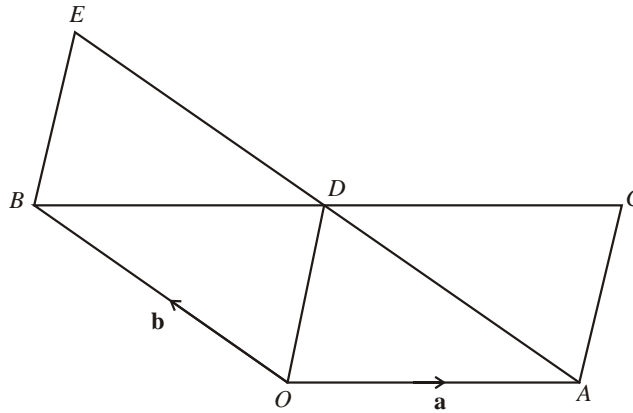
Answer

(2)

(Total 4 marks)

5. In the diagram $OACD$, $OADB$ and $ODEB$ are parallelograms.

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



(a) Express, in terms of \mathbf{a} and \mathbf{b} , the following vectors.
Give your answers in their simplest form.

(i) \vec{OD}

.....

Answer.....

(1)

(ii) \vec{OC}

.....

Answer.....

(1)

(iii) \vec{AB}

.....

Answer.....

(1)

(b) The point F is such that $OCFE$ is a parallelogram.

Write the vector \vec{CF} in terms of \mathbf{a} and \mathbf{b} .

.....

Answer.....

(2)

(c) What geometrical relationship is there between the points O , D and F ? Justify your answer.

.....

.....

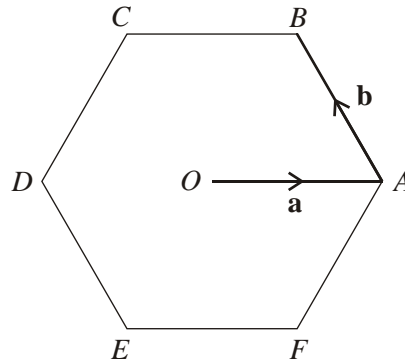
.....

(2)
(Total 7 marks)

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

$\vec{OA} = \mathbf{a}$ and $\vec{AB} = \mathbf{b}$

Diagram drawn accurately



(a) Find expressions, in terms of \mathbf{a} and \mathbf{b} , for

(i) \vec{OB}

Answer

(1)

(ii) \vec{AC}

Answer

(1)

(iii) \vec{EC}

Answer

(1)

(b) The positions of points P and Q are given by the vectors

$\vec{OP} = \mathbf{a} - \mathbf{b}$

$\vec{OQ} = \mathbf{a} + 2\mathbf{b}$

(i) Draw and label the positions of points P and Q on the diagram.

(2)

(ii) Hence, or otherwise, deduce an expression for \vec{PQ} .

.....

Answer

(1)

(Total 6 marks)