

BGCSE EXTENDED – Vectors

1. The vectors p and q are defined as $p = \begin{pmatrix} -7 \\ 24 \end{pmatrix}$ and $q = \begin{pmatrix} 12 \\ -5 \end{pmatrix}$.

Find the column vector for

- (i) $3q$,

Ans:

[1]

- (ii) $p - q$

Ans:

[1]

2. The vectors p and q are defined as $p = \begin{pmatrix} 12 \\ -5 \end{pmatrix}$ and $q = \begin{pmatrix} -6 \\ 5 \end{pmatrix}$.

Calculate

- (i) the column vector $p + 2q$,

Ans:

[2]

3. \overrightarrow{OA} and \overrightarrow{OB} are position vectors relative to the origin O .

Given the points $A(3, -1)$ and $B(-1, 2)$

- (a) write \overrightarrow{OA} and \overrightarrow{OB} as column vectors,

Ans:

[2]

- (b) express \overrightarrow{AB} as a column vector,

Ans:

[2]

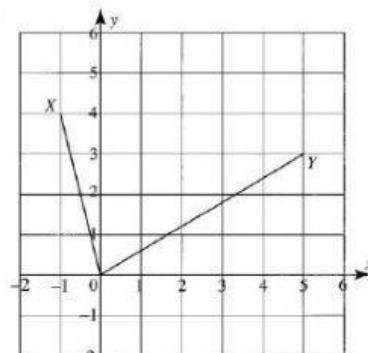
4. The graph shows the position vectors \overrightarrow{OX} and \overrightarrow{OY} .

- (a) Write down the column vectors for \overrightarrow{OX} and \overrightarrow{OY} .

Ans:

- (b) Express \overrightarrow{XY} as a column vector.

Ans:



- 5.(a) Write and simplify an expression in terms of a , b and/or c for

- (i) \overrightarrow{AC}

Ans:

- (ii) \overrightarrow{BX}

Ans:

- (iii) \overrightarrow{XY}

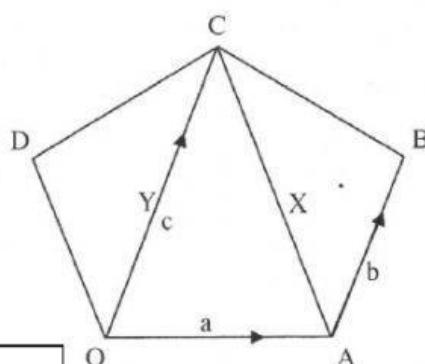
Ans:

- (b)

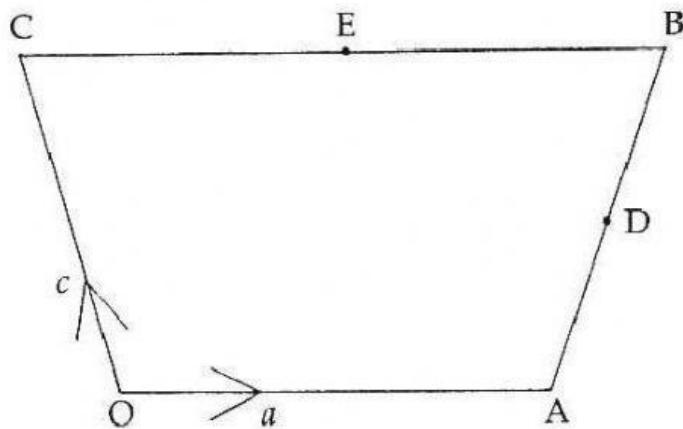
State two geometrical properties of XY and OA .

Ans: 1.

Ans: 2.



6.



not to scale

In the figure, $OABC$ is a trapezium with $OA = a$, $OC = c$ and CB is parallel to, and twice the length of OA . The points D and E are the mid-points of AB and CB respectively.

(a) Find, in terms of a and/or c

(i) \vec{CB} , Ans: [1]

(ii) \vec{CA} , Ans: [1]

(iii) \vec{AB} , Ans: [1]

(iv) \vec{DB} , Ans: [1]

(v) \vec{AE} , Ans: [1]

(b) Express \vec{ED} in terms of a and c . Ans: [2]

(c) State two geometrical relationships between CA and ED , giving reasons for your answers. Ans: Ans: [4]

(d) Give the special name of the quadrilateral $OAEC$. Ans: [1]