

8 $DE = \begin{pmatrix} \sim \\ -4 \end{pmatrix}$

(a) Find $5\overrightarrow{DE}$.

$\begin{pmatrix} \\ \end{pmatrix}$ [1]

(b) Find $|\overrightarrow{DE}|$.

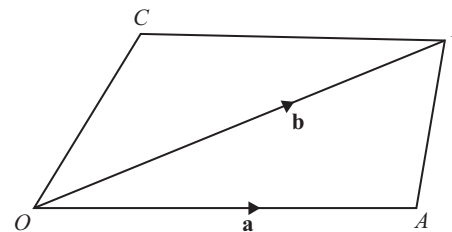
..... [2]

(c) D is the point $(-2, -3)$.

Find the coordinates of the point E .

(..... ,) [2]

18



NOT TO
SCALE

In the diagram, OA is parallel to CB .

$OA : CB = 4 : 3$

$\overrightarrow{OA} = \mathbf{a}$ and $\overrightarrow{OB} = \mathbf{b}$.

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

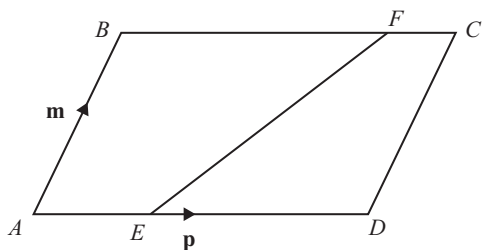
$\overrightarrow{AB} =$ [1]

(b) M is the midpoint of OC .

Find $\overrightarrow{AM}$ in terms of $\mathbf{a}$ and $\mathbf{b}$.

Give your answer in its simplest form.

$\overrightarrow{AM} =$ [3]



NOT TO
SCALE

$ABCD$ is a parallelogram.

$\vec{AB} = \mathbf{m}$ and $\vec{AD} = \mathbf{p}$.

F is a point on BC and $BF = 4FC$.

E is a point on AD and $AE : ED = 1 : 2$.

- (a) Find $\vec{EF}$, in terms of $\mathbf{m}$ and $\mathbf{p}$, in its simplest form.

..... [3]

- (b) EF and DC are extended to meet at the point G .

Find $\vec{CG}$, in terms of $\mathbf{m}$ and/or $\mathbf{p}$, in its simplest form.

8 $\mathbf{m} = \begin{pmatrix} 5 \\ 5 \end{pmatrix}$ $\mathbf{n} = \begin{pmatrix} 3 \\ -3 \end{pmatrix}$

- (a) Find $2\mathbf{m} - \mathbf{n}$.

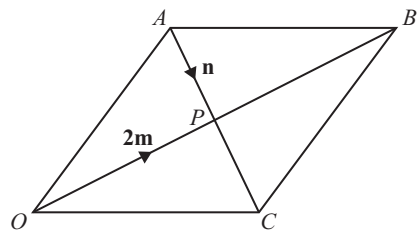
$\begin{pmatrix} \\ \end{pmatrix}$ [2]

- (b) The vector $\begin{pmatrix} 5 \\ \sqrt{y} \end{pmatrix}$ has a magnitude of 7.

Find the value of y .

$y =$ [2]

21



NOT TO
SCALE

$OABC$ is a rhombus and O is the origin.
The diagonals of the rhombus intersect at P .
 $\vec{OP} = 2\mathbf{m}$ and $\vec{AP} = \mathbf{n}$.

(a) Find, in terms of $\mathbf{m}$ and $\mathbf{n}$, in its simplest form

(i) $\vec{OA}$

$\vec{OA} = \dots\dots\dots$ [1]

(ii) $\vec{OC}$.

$\vec{OC} = \dots\dots\dots$ [1]

(b) D is the point such that $\vec{AD} = 10\mathbf{m} - 3\mathbf{n}$.

Show that $OADC$ is a trapezium.

[3]

9 A is the point $(3, -1)$.

$$\vec{AB} = \begin{pmatrix} 2 \\ -4 \end{pmatrix}$$

(a) $\vec{AC} = 2\vec{AB}$

Find the coordinates of the point C .

(..... ,) [2]

(b) The length of AB is $k\sqrt{5}$.

Find the value of k .

$k = \dots\dots\dots$ [2]

(c) P is a point on AB .

$$AP : PB = 1 : 3$$

Find the position vector of P .

(.....) [2]