WWW.M4THS.COM
A LEVEL MATHS

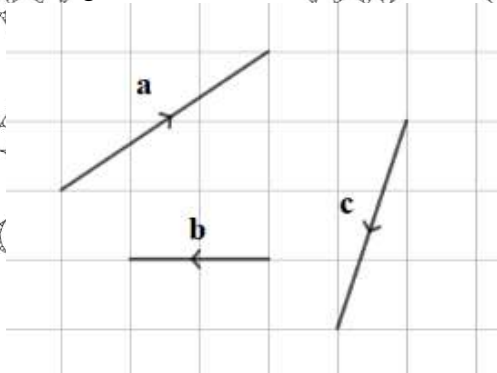# (57) Vectors (Introduction)

WORKING AT D/E

(1) The diagram shows the vectors **a**, **b** and **c** below.

On squared paper draw the vectors:

(i) **a** + **b** (ii) **c** − **b** (iii) 2**b** - **a**

(2) The diagram below shows the parallelogram $OABC$. $\overrightarrow{OA} = a$ and $\overrightarrow{OC} = c$.

X is the midpoint of OA and Y is the midpoint of OC
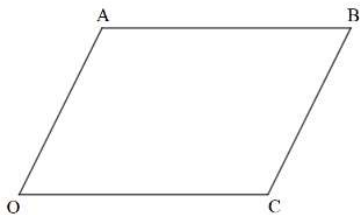
(a) Find an expression in terms or a and c for:

(i) $\overrightarrow{OB}$ (ii) $\overrightarrow{AX}$ (iii) $\overrightarrow{AY}$

(b) Show that the lines BC and OA are parallel.

WORKING AT B/C

(1) Given that the vectors 9**a** + p**b** and 2**a** + 6**b** are parallel, find the value of p.

(2) Which of the following vectors are parallel to the vector **a** + **b** ?

(i) 9(**a** + **b**)
(ii) -3**a** + 3**b**
(iii) **b** − **a**
(iv) 0.5**a** + 0.5**b**
(v) -(**a** + **b**)

(3) $OABC$ is a rectangle. $\overrightarrow{OA} = p$ and $\overrightarrow{OC} = 2q$
The point X lies on OC such that $OX:XC = 1:3$
The point Y lies on CB such that $CY:YB = 3:1$

Prove, using vectors, that the line OB and the line XY are parallel.
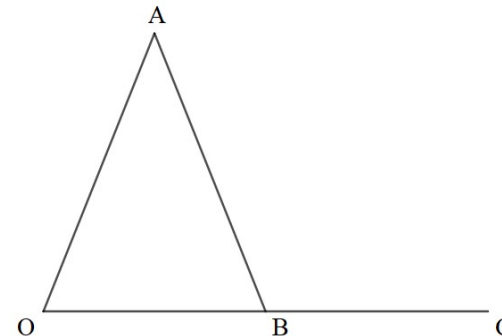
WORKING AT A*/A

(1) The diagram below shows triangle OAB.
OBC is a straight line, $OA = AB$ and $OB = BC$
$\overrightarrow{OA} = a$ and $\overrightarrow{OB} = b$
The point X lies on OA is such that $OX:XA = 2:1$
The point Y lies on AB such that $BY:YA = 1:2$

(a) Show that the line XYC is not a straight line. You must show full workings.

(b) Find a vector $\overrightarrow{OD}$ such that XYD is a straight line. You must show full workings.