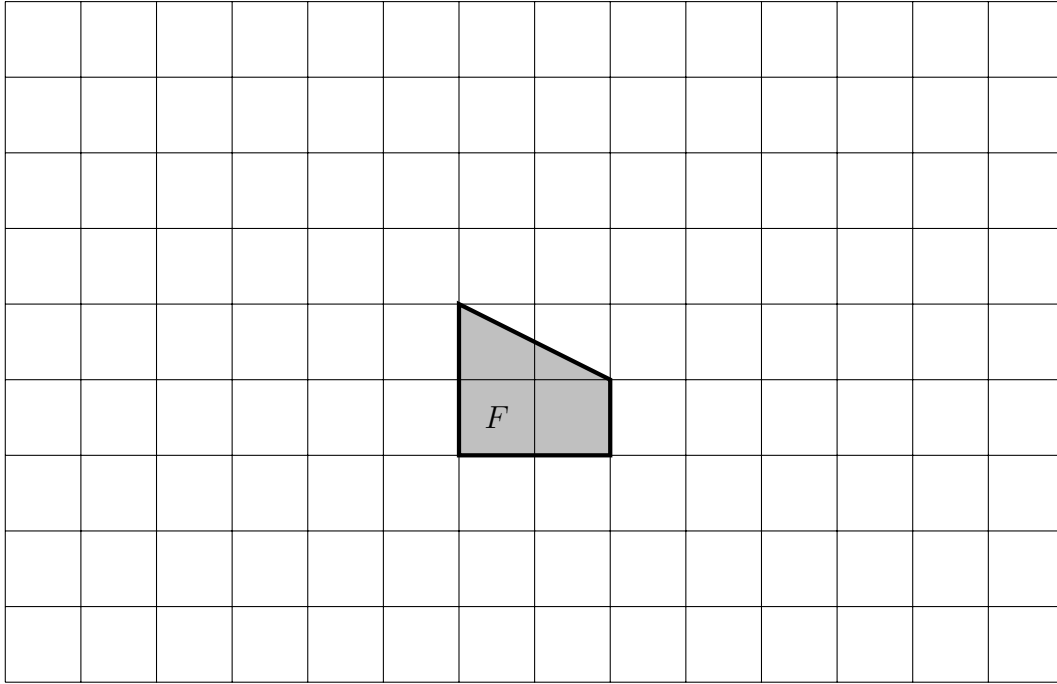
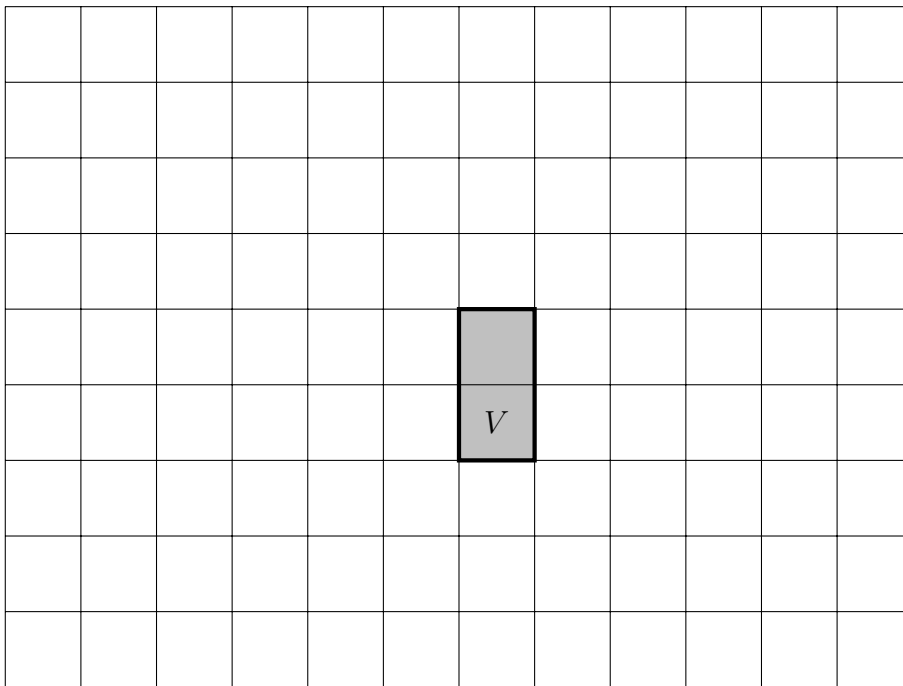


1. Translate shape F four squares to the left. {translate in one direction 2/3/4/ left/right/up/down}



2. Translate shape V two squares to the left and one square up.



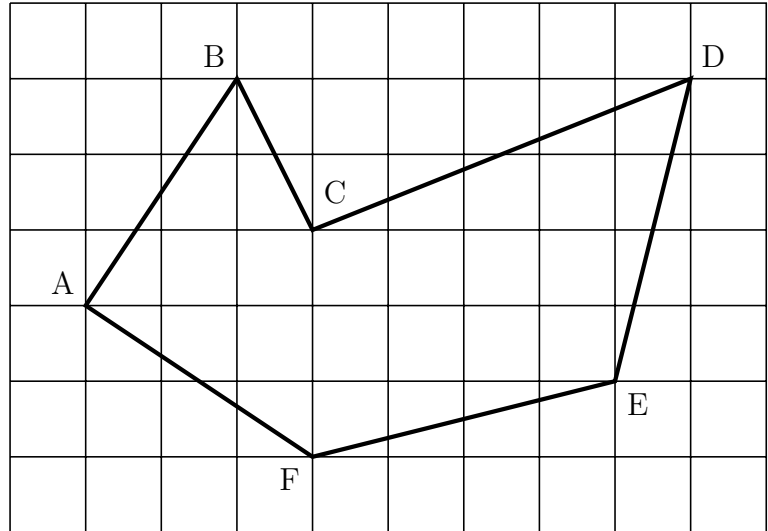
3.

3. not. written yet

4. ABCDEF is an irregular hexagon.

Write down the vector \vec{AB}

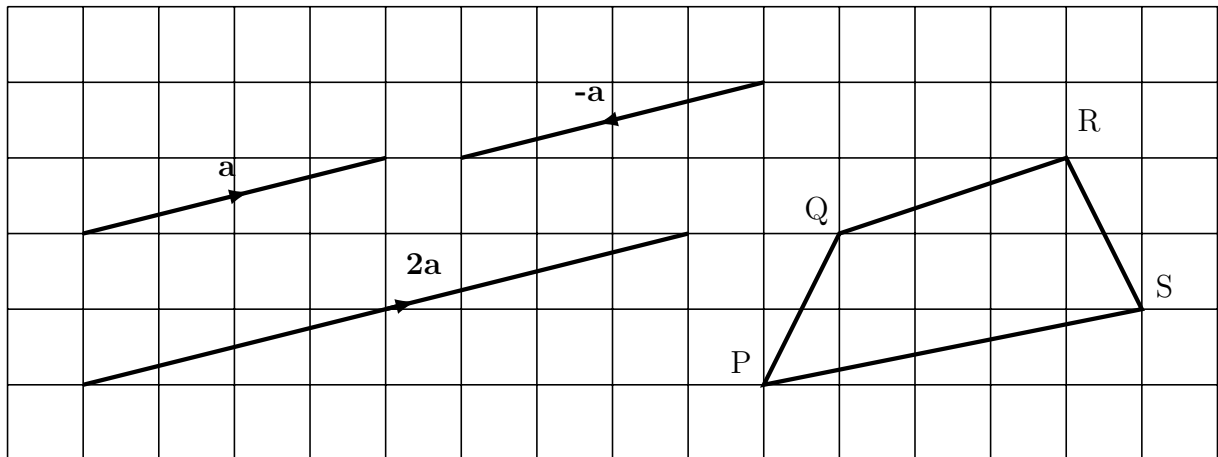
$$\vec{AB} = \begin{pmatrix} \dots \\ \dots \end{pmatrix}$$



5.

5. not written yet

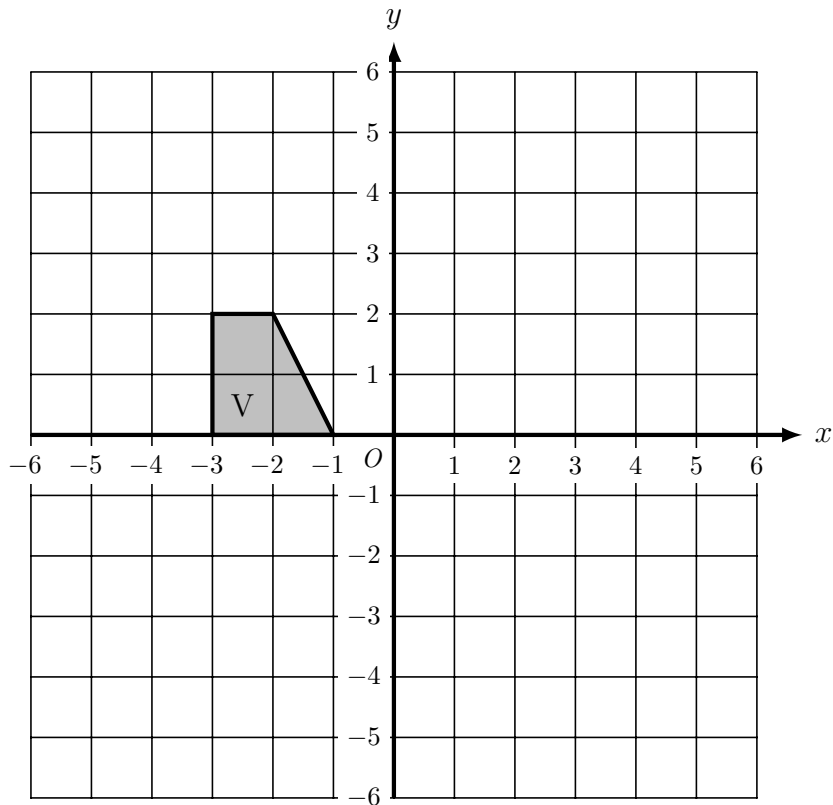
6. Here are some vectors.



Write down the column vectors for

(i) $\mathbf{a} = \begin{pmatrix} \\ \end{pmatrix}$ (ii) $-\mathbf{a} = \begin{pmatrix} \\ \end{pmatrix}$ (iii) $2\mathbf{b} = \begin{pmatrix} \\ \end{pmatrix}$ (iv) $\vec{SR} = \begin{pmatrix} \\ \end{pmatrix}$

7. On the grid below, translate trapezium V by the vector $\begin{bmatrix} 2 \\ -1 \end{bmatrix}$ and label it W

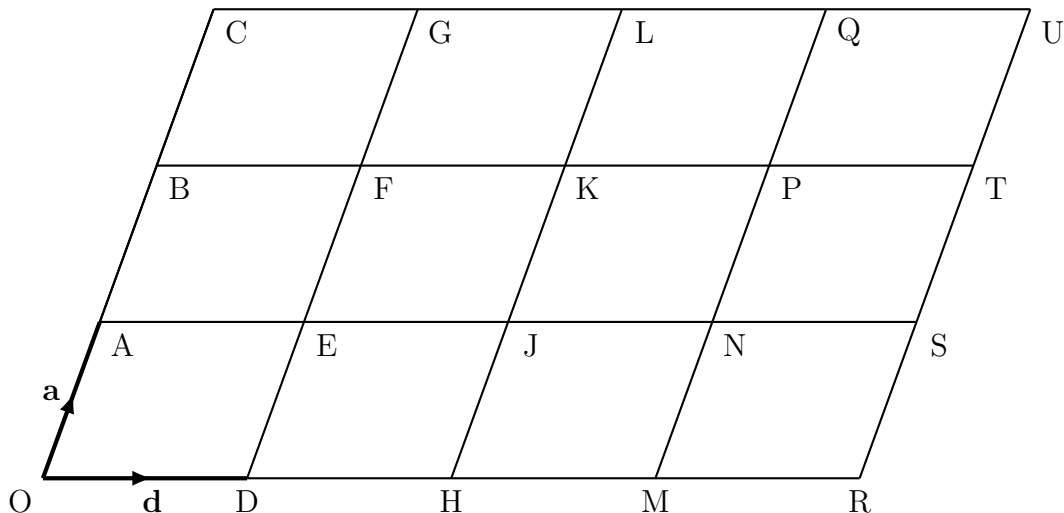


8. $\mathbf{p} = \begin{pmatrix} 5 \\ -3 \end{pmatrix}$ $\mathbf{q} = \begin{pmatrix} -2 \\ 1 \end{pmatrix}$

Complete these column vectors

(i) $2\mathbf{p} = \begin{pmatrix} \dots \\ \dots \end{pmatrix}$ (ii) $3\mathbf{q} = \begin{pmatrix} \dots \\ \dots \end{pmatrix}$

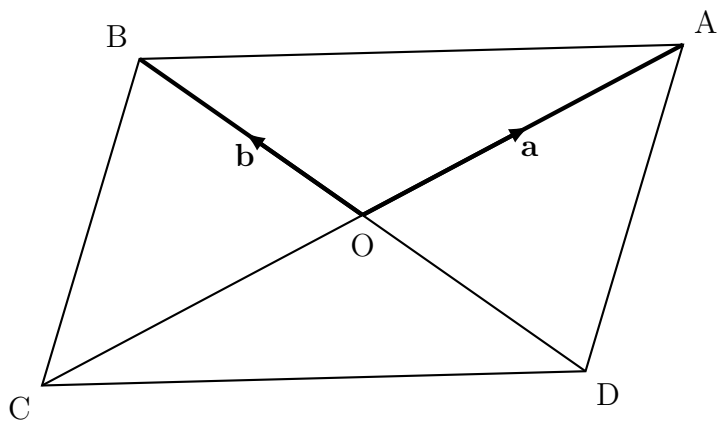
9. (a) The diagram below shows 12 congruent parallelograms.



$\vec{OA} = \mathbf{a}$ {Handwriting **bold** is hard to do so mathematicians write a instead of **a**}
 $\vec{OD} = \mathbf{d}$ {and write d instead of **d**}

Find in terms of **a** and **d** the vectors

- (i) $\vec{AC} = \dots\dots\dots$ (ii) $\vec{GU} = \dots\dots\dots$
 (b) The diagram below shows parallelogram ABCD



The diagonals of the parallelogram intersect at O

$\vec{OA} = \mathbf{a}$ {Handwriting **bold** is hard to do so mathematicians write a instead of **a**}
 $\vec{OB} = \mathbf{b}$ {and write b instead of **b**}

Write an expression, in terms of **a** and **b** for

- (i) $\vec{CO} = \dots\dots\dots$ (ii) $\vec{DB} = \dots\dots\dots$

10. $\mathbf{a} = \begin{pmatrix} -2 \\ -1 \end{pmatrix}$ $\mathbf{b} = \begin{pmatrix} 3 \\ -4 \end{pmatrix}$

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

$$\begin{pmatrix} \dots \\ \dots \end{pmatrix}$$

11. $\mathbf{a} = \begin{pmatrix} 2 \\ -1 \end{pmatrix}$ $\mathbf{b} = \begin{pmatrix} -2 \\ 3 \end{pmatrix}$

Work out $3\mathbf{a} + 2\mathbf{b}$ as a column vector.

$$\begin{pmatrix} \dots \\ \dots \end{pmatrix}$$