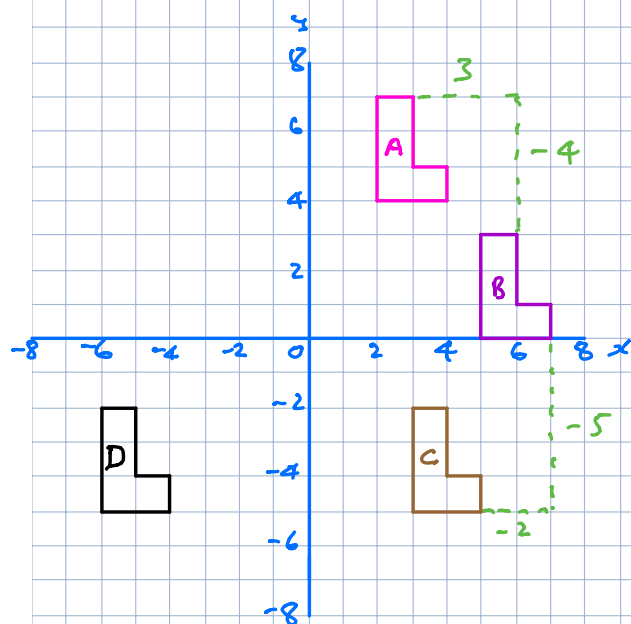


## Transformations:

Translations  
Reflections  
Rotations  
Enlargements

## Translations



Translate A by  $\begin{pmatrix} 3 \\ -4 \end{pmatrix}$   
to give B

Translate B by  $\begin{pmatrix} -2 \\ -5 \end{pmatrix}$   
to give C

Translate C by  $\begin{pmatrix} -9 \\ 0 \end{pmatrix}$   
to give D

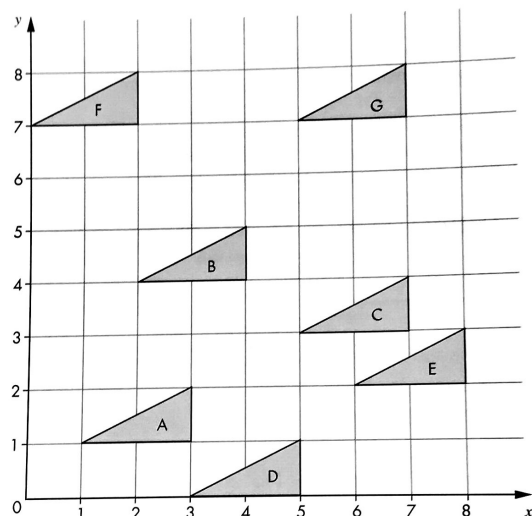
What translation is  
required for D to move  
back to A

A translation by  $\begin{pmatrix} 8 \\ 9 \end{pmatrix}$

$\begin{pmatrix} x \\ y \end{pmatrix}$  is called a column vector and determines  
how far to move in the x and y directions.  
The top number is always x and the bottom y.

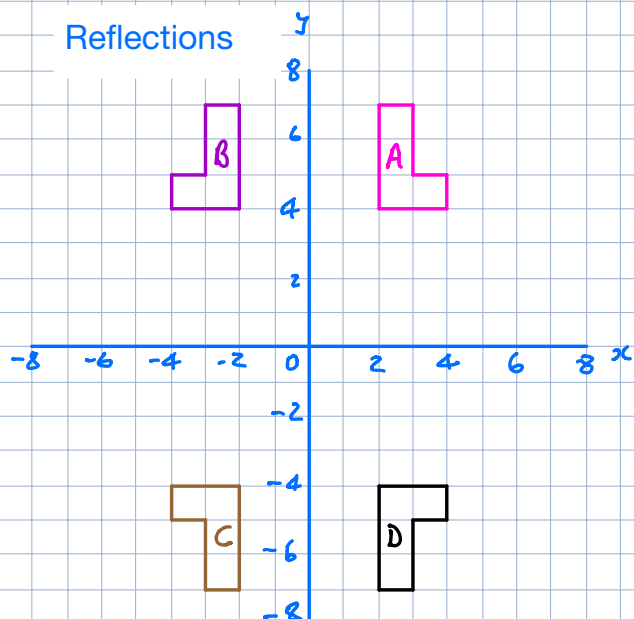
**T** Use vectors to describe the following translations.

- |            |           |            |           |          |           |
|------------|-----------|------------|-----------|----------|-----------|
| a i A to B | ii A to C | iii A to D | iv A to E | v A to F | vi A to G |
| b i B to A | ii B to C | iii B to D | iv B to E | v B to F | vi B to G |
| c i C to A | ii C to B | iii C to D | iv C to E | v C to F | vi C to G |
| d i D to E | ii E to B | iii F to C | iv G to D | v F to G | vi G to E |



A to B translation by  $\begin{pmatrix} 1 \\ 3 \end{pmatrix}$   
 A to C translation by  $\begin{pmatrix} 4 \\ 2 \end{pmatrix}$   
 A to D translation by  $\begin{pmatrix} 2 \\ -1 \end{pmatrix}$

Reflections



Reflect A in y-axis  
to give B

Reflect B in x-axis  
to give C

Reflect C in y-axis  
to give D

