

# TRANSFORMATIONS

There are four different types of transformations:

Reflection of a shape

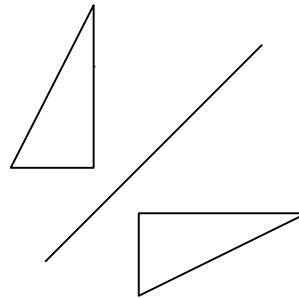
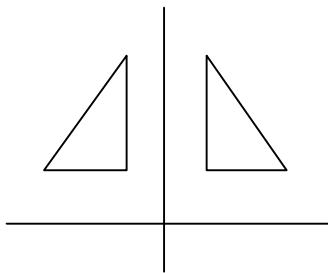
Rotation of a shape

Enlargement of a shape

Translation of a shape

## Reflections

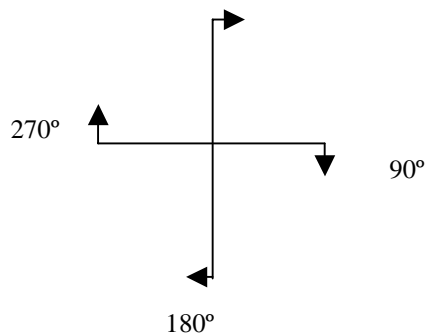
This involves flipping a shape across to the other side of a mirror line.



The line that the shape is reflected through is called the line of reflection.  
When giving your answer you must state the line of reflection.

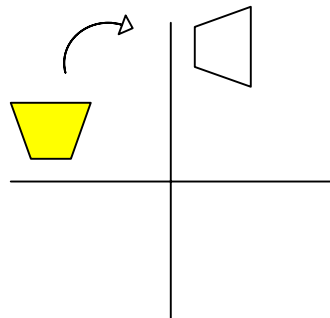
## Rotations

They always have a centre of rotation that can be stated by co-ordinates.  
As well as a degree of turn and a direction of turn (anti-clockwise or clockwise)



Sometimes it is hard to picture the shape turning so using tracing paper. Turning your page to help you could also give you the answer.

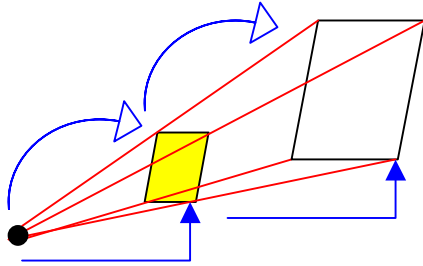
In this example the shaded shape has been rotated  $90^\circ$  in a clockwise direction about the point (0,0)



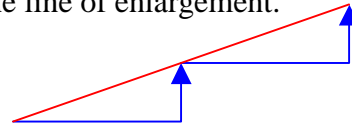
## Enlargements

In your answer you must state the centre of enlargement as well as the scale factor for the enlargement. (A scale factor 2 would double the shape's measurements.)

The centre of enlargement is like a torch creating a shadow on a wall.



It is easier and more accurate to use an L shape and make repeated steps to create the line of enlargement.



If you are given both the original shape and the enlarged shape it is possible to use your ruler and line up two of the same points and trace back to the centre of enlargement.

## Translations

This is the only transformation that does not change the visual appearance of the shape. It is just a movement of the shape around the grid.

The movement of the shape can be expressed in the form of a **vector**

This vector would describe a movement of 2 units to the right  
and 6 units down

$$\begin{pmatrix} 2 \\ -6 \end{pmatrix}$$

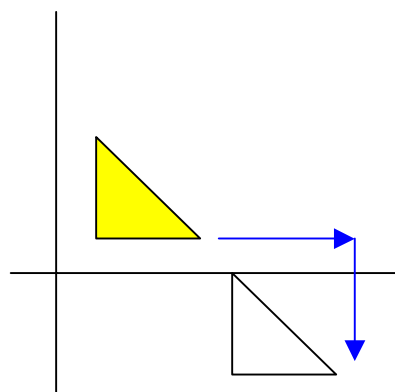
The top part of the vector shows the movement in the x - direction with a minus sign indicating movement to the left.

The bottom part of the vector shows movement in the y - direction with a minus sign indicating movement down.

This translation shows the top shape moving 4 places to the right and 4 places down.

A positive number on top will give the movement to the right (4)

And a negative number on the bottom will give the downward movement (-4)



The vector is

$$\begin{pmatrix} 4 \\ -4 \end{pmatrix}$$