

## 1. Keywords

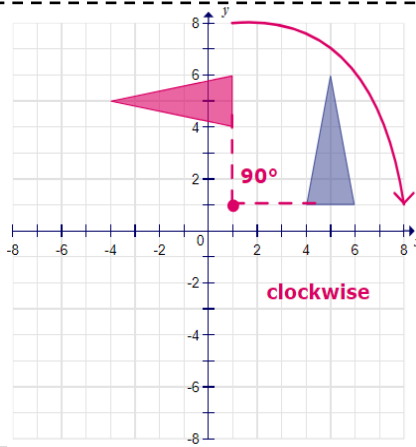
Reflection  
 Translation  
 Rotation  
 Enlargement  
 Scale Factor  
 Mirror Line  
 Centre of Rotation

## 3. Rotation

Shapes can be transformed by **rotation**.

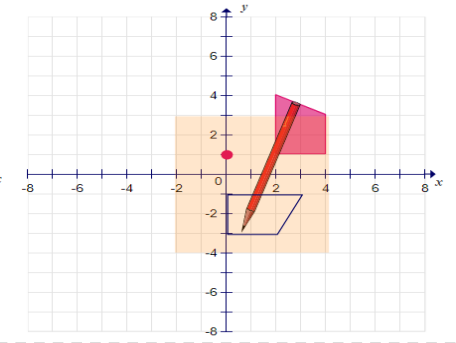
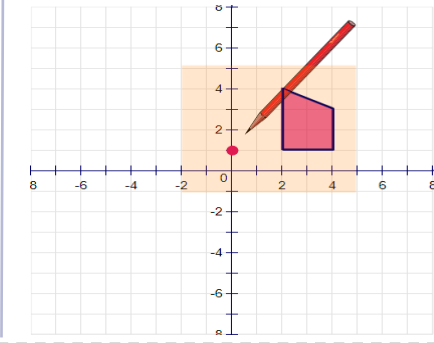
To describe a rotation you need to state **3** things:

- The **centre** of rotation
- The **angle** of rotation
- The **direction** of rotation (**clockwise** or **anticlockwise**)



Rotating shapes using tracing paper

Use tracing paper to rotate this shape 90° clockwise about the point (0,1)



# Maths, Y9—Transformations

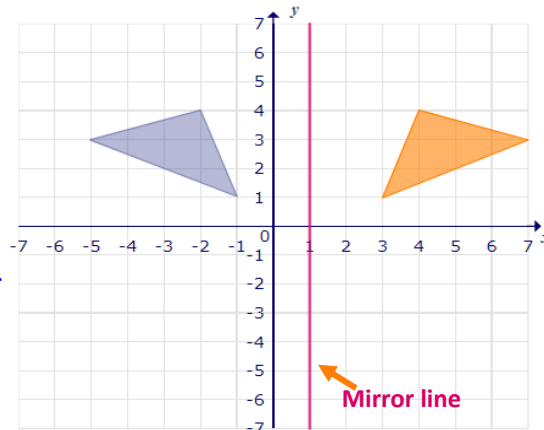
## 2. Reflection

Shapes can be transformed by **reflection**.

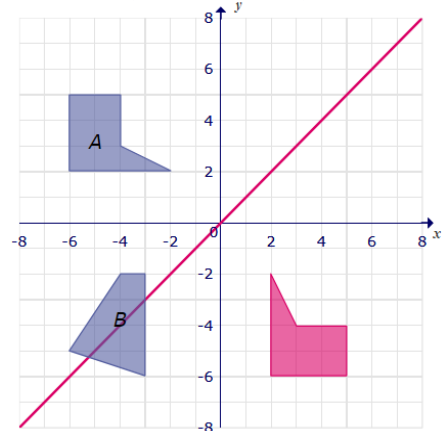
To describe a reflection, you need to say where the **mirror line** is.

Describe the reflection.

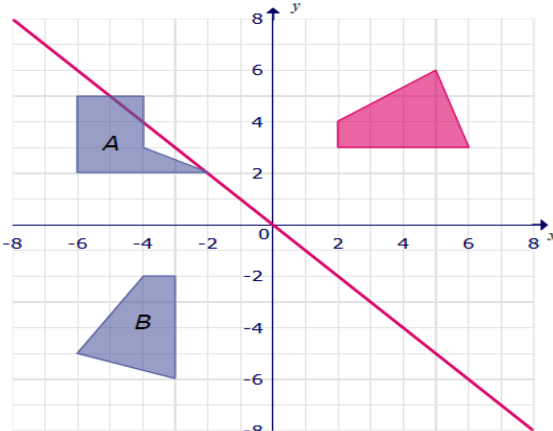
The shape has been reflected in the mirror line  $x = 1$



Reflect shape A in the line  $y = x$ .



Reflect shape B in the line  $y = -x$ .

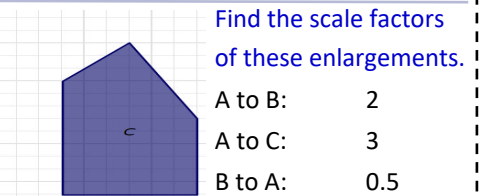
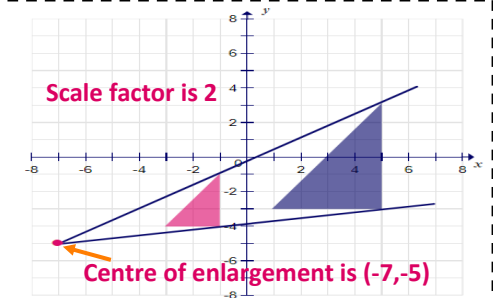


## 4. Enlargement

Shapes can be transformed by **enlargement**.

To describe an enlargement you need to state **2** things:

- How many times bigger the shape has become. This is called the **scale factor**.
- Where the **centre of enlargement** is.



## 5. Translation

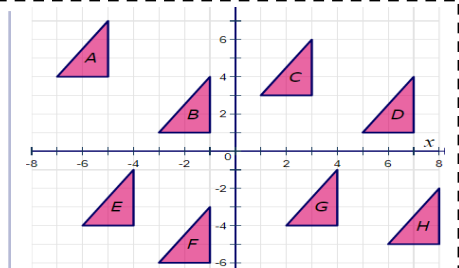
Shapes can be transformed by **translation**.

To describe a translation you need to state **2** things:

- How many units left or right the shape has moved.
- How many units up or down the shape has moved.

We communicate this information by using a **vector**.

$\begin{pmatrix} 3 \\ 2 \end{pmatrix}$  This number tells you **how many units across** it goes. The shape will move **3 units to the right**.  
 This number tells you **how many units up or down** it goes. The shape will move **2 units up**.



Describe the translations.

D to G: translated by the vector  $\begin{pmatrix} -2 \\ -5 \end{pmatrix}$   
 G to E: translated by the vector  $\begin{pmatrix} -8 \\ 0 \end{pmatrix}$   
 C to H: translated by the vector  $\begin{pmatrix} 5 \\ -8 \end{pmatrix}$