

Shape

Topics

- Loci
- Bisections
- Triangles

Spring term

Constructions

What do I need to be able to do?

- Be able to bisect a line
- Be able to bisect an angle
- Be able to construct a triangle
- Be able to answer loci problems
- Be able to use a compass accurately

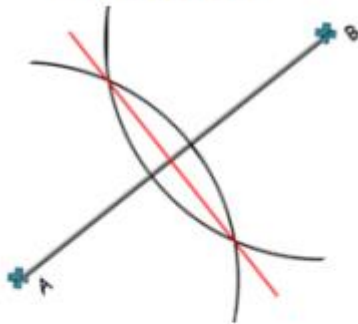
Career Links

- Being able to confidently work with shape is a skill with links to these careers
- Architecture / Cartography/ Construction
- Building

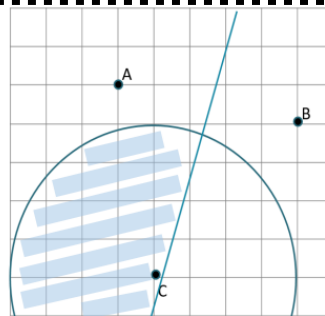
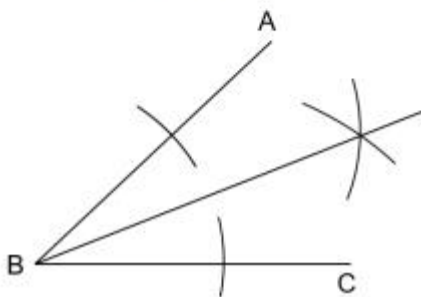
Key Vocabulary

| | |
|-------------|--|
| Locus | A set of points which obey a certain rule |
| Bisect | Divide in to 2 parts |
| Equidistant | The same distance from something at all times |
| Compass | A tool used to draw curves |
| Angle | The space between 2 intersecting lines or surfaces |
| Construct | To accurately draw something |

Line bisector



Angle bisector



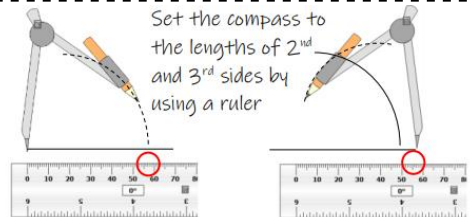
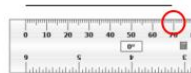
Shade the region that is:
 - closer to A than B
 - less than 4 cm from C

Line bisector of A and B

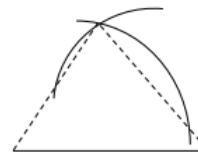
Circle with radius 4cm

SSS Triangle

Draw the 1st side as a base



Set the compass to the lengths of 2nd and 3rd sides by using a ruler

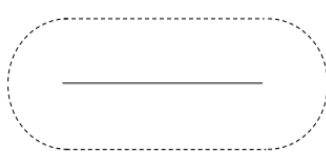


Use a ruler to connect the ends of the base to the overlap

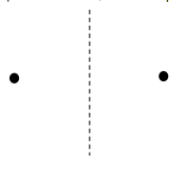
Equidistant from a point



Equidistant from a line

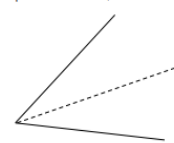


Equidistant from 2 points



The same as a perpendicular bisector

Equidistant from 2 lines



The same as an angle bisector



SHAPE

Topics

- Column vectors
- Transformations

Spring term

Transformations

What do I need to be able to do?

- Represent, add, and subtract vectors
- Translate shapes using vectors
- Reflect, rotate, and enlarge shapes
- Describe a transformation

Career Links

- Being able to confidently work with shape and geometric rules is a skill with links to these careers
- Air travel
- Animation
- Architecture
- Physics

Key Vocabulary

| | |
|--------------|--|
| Vector | A vector has magnitude and direction |
| Reflect | An image or shape as it would be seen in a mirror |
| Rotate | A circular movement around a central point |
| Enlarge | To make bigger |
| Scale factor | The ratio between the scale of a given object and a new object |
| Translation | Moving a shape without rotating or flipping it |

Vectors

Vectors are often written as column vectors

Left or right \rightarrow (3)
Up or down \rightarrow (-4)

Positive values are right and up. Negative values are left and down.
This is 3 right and 4 down.

This is the vector $\begin{pmatrix} 4 \\ 1 \end{pmatrix}$



It goes 4 units right and 1 unit up.

Add/subtract vectors:

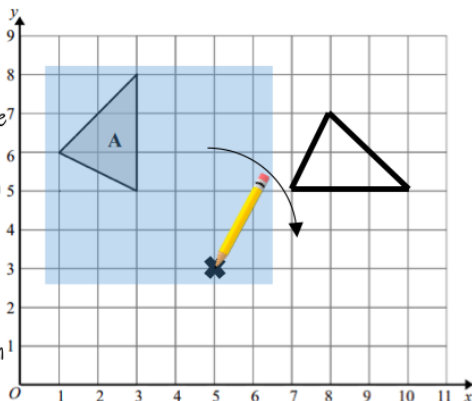
$$\begin{pmatrix} 8 \\ 4 \end{pmatrix} - \begin{pmatrix} 3 \\ 6 \end{pmatrix} = \begin{pmatrix} 5 \\ -2 \end{pmatrix}$$

Multiply vectors by a constant

$$3 \begin{pmatrix} 4 \\ 7 \end{pmatrix} = \begin{pmatrix} 12 \\ 21 \end{pmatrix}$$

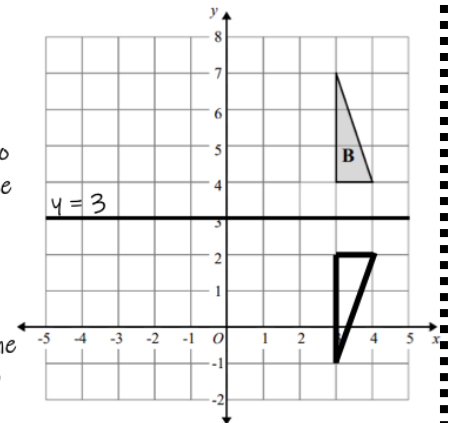
Rotation: e.g. rotate shape A 90° clockwise about (5,3)

Draw the object onto tracing paper and put the pencil on the centre of rotation (5,3). Then rotate the tracing paper as instructed and draw the image in its new position.



Reflection: e.g. reflect shape B in the line $y = 3$

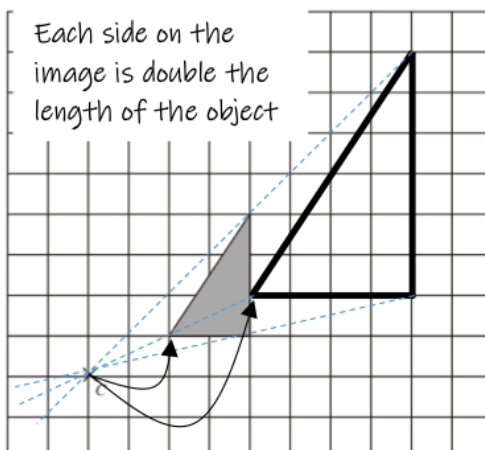
Draw on the line of reflection. Reflect each point to the other side of the line of reflection. Each point on the image is the same distance from the line of reflection as they are on the object.



Enlargement: e.g. Enlarge the shaded shape by scale factor of 2, centre C.

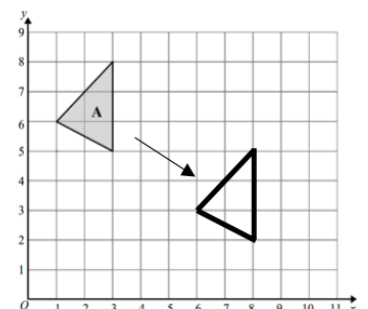
Counting from C to the first vertex, it was 2 squares right and 1 square up, so the image will be double that (s.f. of 2) so 4 right and 2 up from the centre, C.

Each side on the image is double the length of the object



Translation: e.g. translate triangle A by the vector $\begin{pmatrix} 5 \\ -3 \end{pmatrix}$

A translation is a movement, so in this instance it moves 5 squares right and 3 squares down.



Rotation, reflection and translation all leave a congruent (identical) shape to the object.