

Chapter 15

Transformation Geometry 1

Transformation geometry involves the study of the movement of shapes from one position to another. In our course, we will study the movement of shapes under the following **transformations**:

- **Translations**
- **Rotations**
- **Axial Symmetries**
- **Central Symmetries**
- **Enlargements and Reductions**

We will study the first four transformations in this chapter, and in chapter 26. These are called **isometries**. We will study enlargements and reductions in chapter 28. These are called **similarities**.

An **isometry** is a transformation that preserves shape and size.

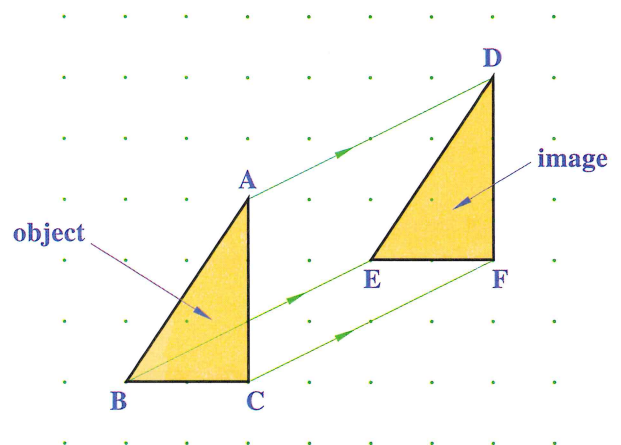
A **similarity** is a transformation that preserves shape but not size.

Translations

Under a **translation** all points are moved the same distance in the same direction.

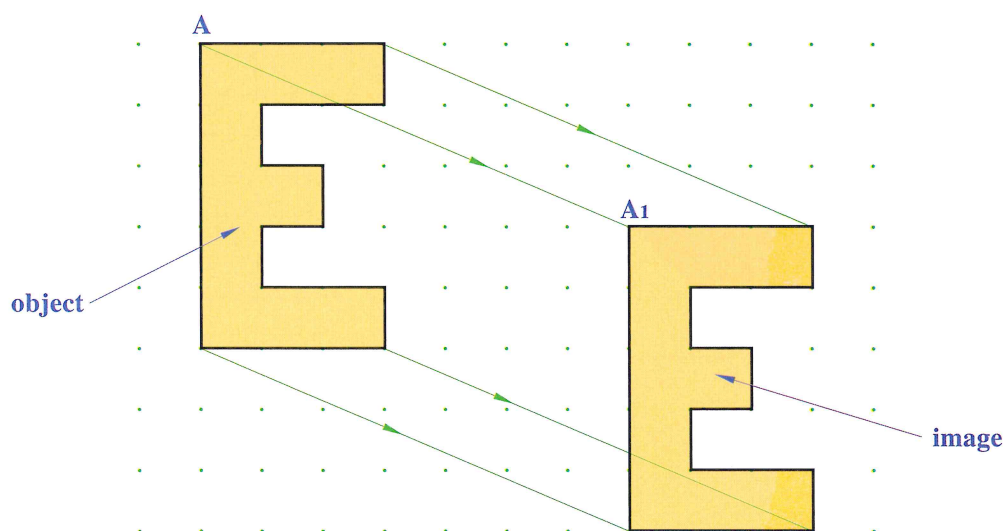
In the figure across, every point of the triangle ABC is moved to a new position on the triangle DEF. The triangle ABC is called the **object** and the triangle DEF is called the **image**.

Every translation has a **translation vector**, which tells you the distance and direction of movement. In the figure over, the translation vector is the line joining A to D.



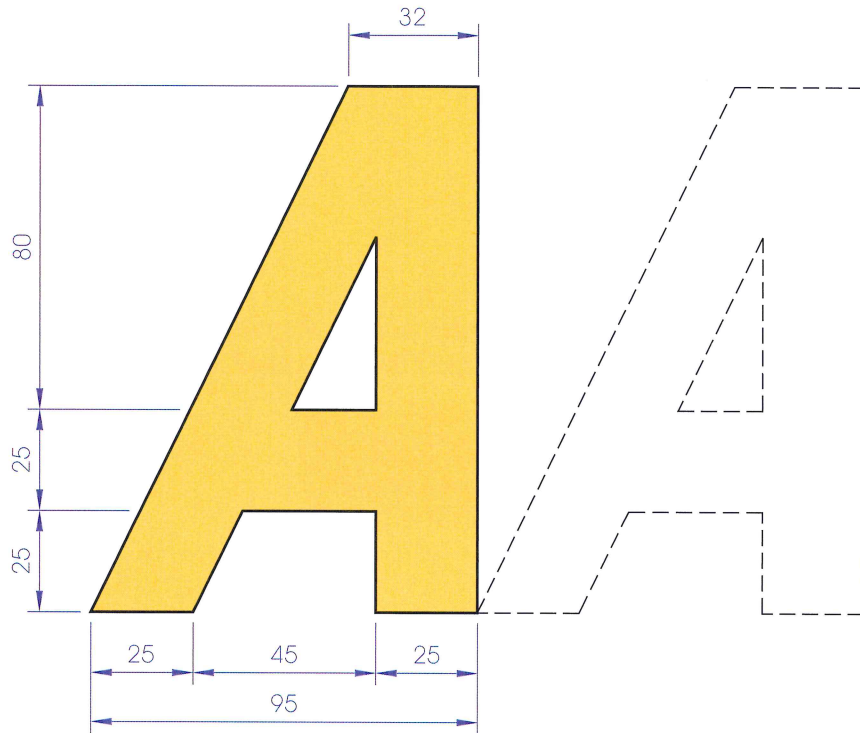
Example

The figure below shows the image of the letter 'E' under a **translation** from point A to A_1 .



Exercises

1. Each one of the letters of the **AA monogram** is the image of the other under a **translation**. Copy the drawing shown in the figure below and use a **translation** to complete the monogram.



The figure below shows an incomplete **Bed and Breakfast** sign drawn on a 10 mm square grid. Copy the given figure and complete the sign by drawing the image of the letter 'B' under a **translation** from point A to A_1 .

