UNIT 37 *Further Transformations* Introduction to SIM

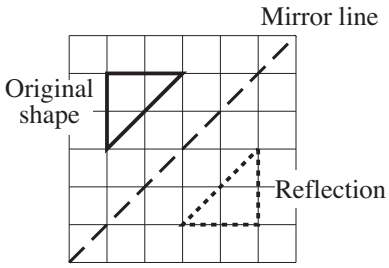
Learning objectives

This unit contiues the transformations theme from Unit 36. After completing this unit of STUDENT INSTRUCTIONAL MATERIAL (SIM) you should

- understand how to apply the concept of reflection of a shape in a mirror line
- understand the concept of the rotation of a shape with a given angle, direction and centre
- understand and be able to apply the concept of translation of a shape in a given direction
- be able to conbine two or more transformations.

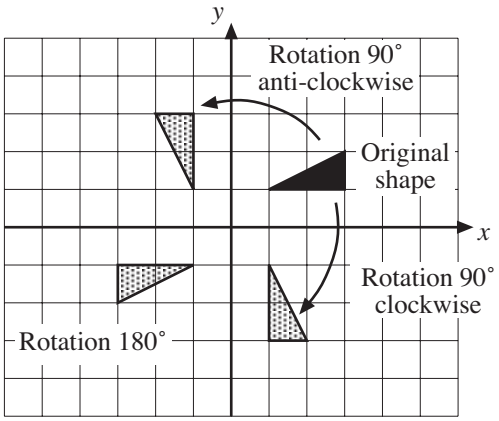
Key points and principles

- *Reflections* are obtained when you draw the image of a shape in a mirror line. An example is shown opposite.



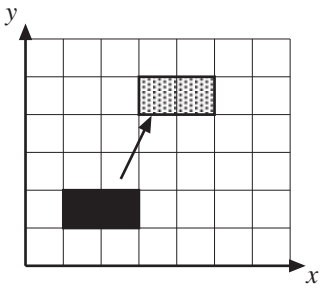
- *Rotations* are obtained when a shape is rotated about a point, the *centre of rotation*, through a specified angle.

  For example,



- *Translations* move all points on the shape in the same direction and the same distance.

  The diagram opposite shows the translation



$$\left\{\begin{array}{l} 2 \text{ in } x\text{-direction} \\ 3 \text{ in } y\text{-direction} \end{array}\right\}$$

  and we write $\begin{pmatrix} 2 \\ 3 \end{pmatrix}$.

Glossary of terms

- *Reflections* are obtained when you draw the image of a shape in a mirror line (see example above).
- *Rotations* are obtained when a shape is rotated about a point, the *centre of rotation*, through a specified angle (example above).
- *Translations* move all points on the shape in the same direction and the same distance (example above).

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- *Combined transformation* is when the shape is transformed to its image and this image is then transformed to a second shape.

  For example, rotate the shape ABC by 180° about the origin to obtain the image A'B'C'.

  Reflect this image in the *x*-axis to obtain A"B"C".

  Note that the transformations from ABC to A"B"C" can be done in one transformation, namely, reflection in the *y*-axis.