

5.2 Transformations

Name: _____ Class: _____ Date: _____

KEY WORDS centre of enlargement

<!-- Session 2 native-skill companion -->

Objective

Practise transformations within the labelled native lessons. Public original tasks; locally authored answer guidance.

1 Key knowledge and worked examples

■ Reflections, rotations and enlargements · Foundation

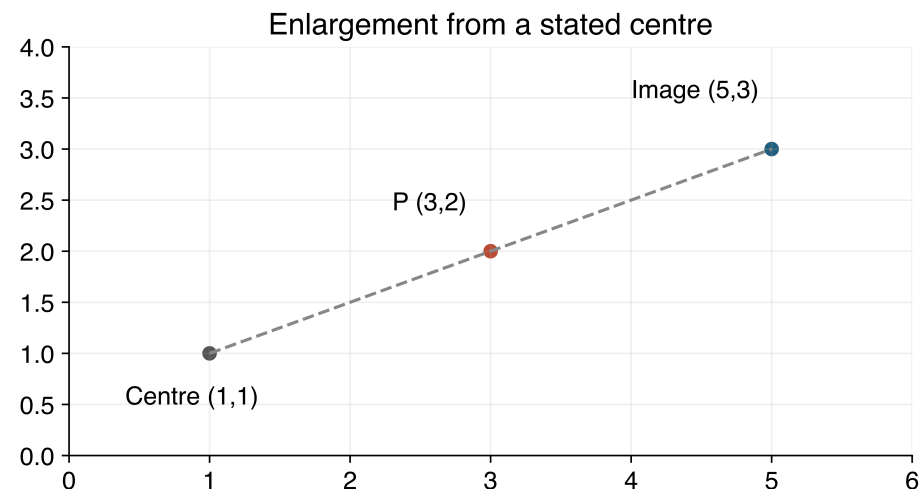
A translation adds a vector. A reflection reverses signed perpendicular distance from a mirror line. A rotation needs a centre, angle and direction. For enlargement from C, use new $P = C + k(P - C)$.

$$\mathbf{p}_{\text{image}} = \mathbf{c} + k(\mathbf{p} - \mathbf{c})$$

For $C=(1,1)$, $P=(3,2)$, $k=2$, $P-C=(2,1)$, so new $P=(1,1)+2(2,1)=(5,3)$. Reflection of $(3,2)$ in the y-axis gives $(-3,2)$. A 90° anticlockwise rotation about the origin gives $(-2,3)$.

A rotation needs its centre and direction, not just an angle. A negative enlargement factor places the image on the opposite side of the centre. A translation does not change orientation or size.

Describe a transformation completely before constructing the image. Check corresponding distances and angles. For combined transformations, apply them in the stated order; they usually do not commute.



Original native-lesson illustration; labels belong to its worked example.

2 Practice

2.1 (Foundation) For $C=(1,1)$, $P=(3,2)$, $k=2$, find the image x-coordinate.

2.2 (Foundation) For that enlargement, find the image y-coordinate.

2.3 (Foundation) Reflect $(3,2)$ in the y-axis. Find the new x-coordinate.

3 Exam-style questions

3.1 Decide whether this claim is true. Justify with a concrete calculation or counterexample: Every enlargement is centred at the origin unless its scale factor is negative.

Solutions

2.1 Image= $C+2(P-C)$. Its x-coordinate is $1+2(3-1)=5$.

2.2 Its y-coordinate is $1+2(2-1)=3$.

2.3 Reflection in the vertical axis negates x: 3 becomes -3.

3.1 False. Centre (1,1), positive scale factor 2 maps (3,2) to (5,3). The origin is not the centre; the centre is specified independently of the factor's sign.

Local review guidance: show the chosen method; give the checked result; explain the condition or failed shortcut. This is authored classroom guidance.