Enlargement

- Enlarging a shape given a scale factor and a centre of enlargement
- Recognising key features of an enlargement
- Finding the scale factor of an enlargement
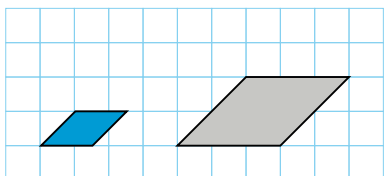- Finding the centre of an enlargement
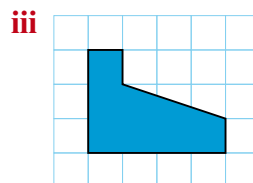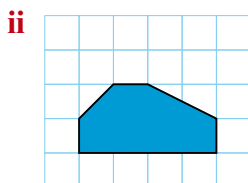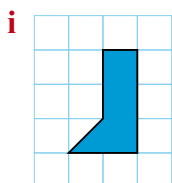
Keywords

You should know

explanation 1a   explanation 1b

1 The diagram shows the enlargement of a blue parallelogram.
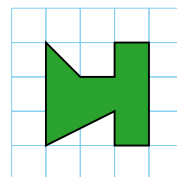
a What is the scale factor of the enlargement?

b On squared paper, draw each shape and its enlargement with scale factor 2.

i   **ii**   **iii**

2 The diagram shows a nonagon.

a On $1\,cm^2$ paper, copy the nonagon. Draw an enlargement of the shape, using a scale factor of 3.

b What property of the shape does not change when the shape is enlarged?

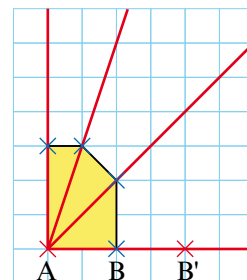**c** Name two things that get 3 times bigger when the shape is enlarged.

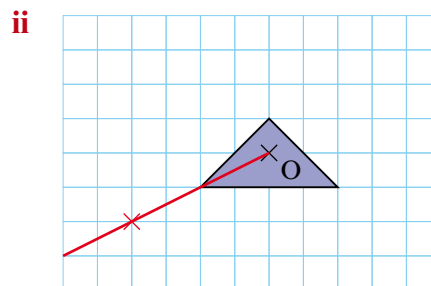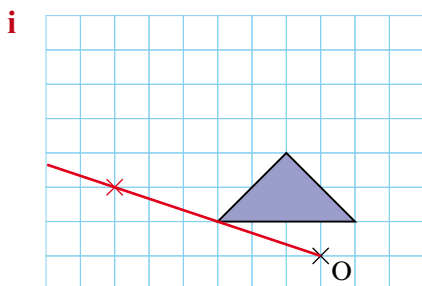explanation 2a   explanation 2b   explanation 2c   explanation 2d

3   Sarah is finding the image of a shape under an
enlargement, scale factor 2 and centre A.
She starts by drawing lines from the centre that
pass through each vertex.

   a   Explain why the point A does not move.

   b   Explain how she found the image of B.
   (It is labelled B' on the diagram.)

   c   Copy the diagram and complete the enlargement of the shape.

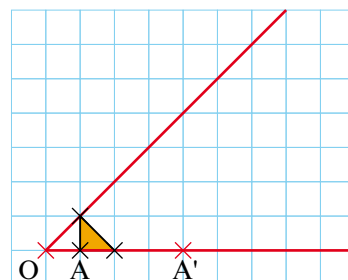**4**   Each diagram shows a triangle and a point O.

   a   For each triangle, draw an enlargement, scale factor 2 and centre O.
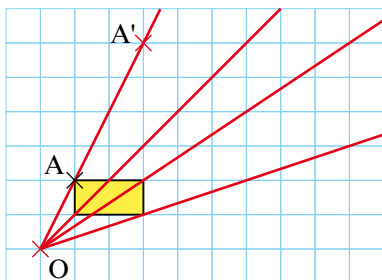   The image of one vertex has been done for you.

   i   **ii**

   b   In each case, the object is an isosceles triangle.
   Comment on the size and shape of each image.

   c   What does an enlargement not change?

   d   What effect does the centre have on an enlargement?

5   The diagram shows the image of one vertex of a
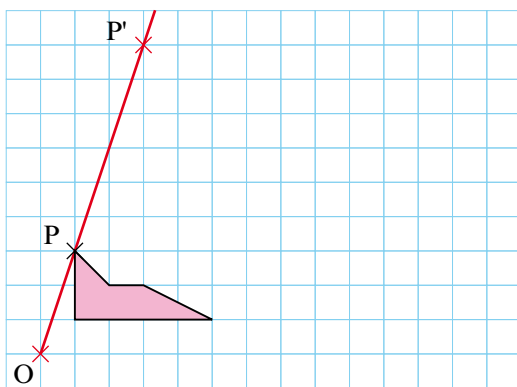triangle under an enlargement, centre O.

   a   What is the scale factor of the enlargement of
   the triangle?

   b   Copy and complete the enlargement.

   c   Comment on the shape of the image of the
   triangle.

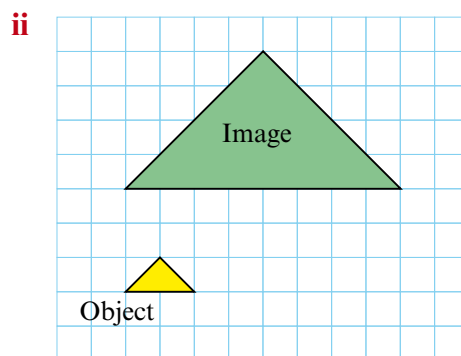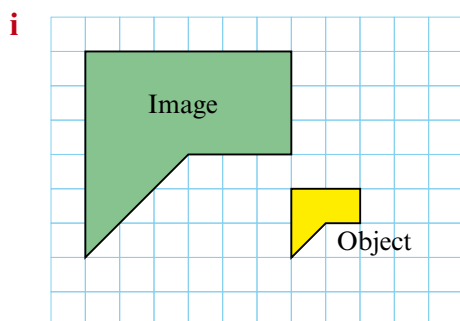**6**   The diagram shows the image of one vertex of a rectangle under an enlargement, centre O.

a   Terry says that the scale factor of the enlargement of the rectangle is 3. Explain why he is correct.

b   Copy and complete the enlargement.

c   i   What is the perimeter of the yellow rectangle?

   ii   What is the perimeter of the image of the rectangle?

7   John thinks that he has found a quick way to enlarge a shape.
He says "The size of all the angles stay the same. So all you have to do is to find the image of one vertex and then draw the enlargement of the shape."

a   Will this method work?

b   John has found the image of the vertex P, using a scale factor of 3 and centre O. Copy the diagram and complete the enlargement.
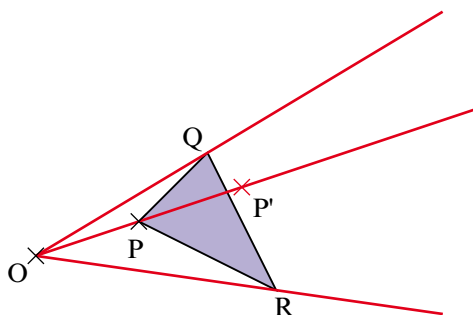
8 Each diagram shows an object and an image.

   a State the scale factor of each enlargement.

   b Copy each diagram and find each centre of enlargement.
Label the centre O in each case.

9 On a piece of plain paper, Sally draws a triangle PQR and a point O that lies outside the triangle. O is the centre of an enlargement of the triangle.
She draws three red lines from O, passing through each vertex of the triangle.

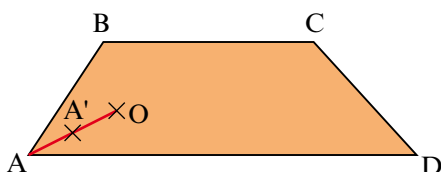

   a OP' is twice OP. What is the scale factor of the enlargement?

   b On plain paper, copy and complete the enlargement of the triangle PQR with this scale factor.

   c What is the relationship between the lengths of QR and Q'R'?

10 On a piece of plain paper, Sunil draws a quadrilateral and a point O that lies inside the quadrilateral. O is the centre of an enlargement of the quadrilateral. The mark for A' is halfway between O and A.

   a What is the relationship between OA and OA'?

   b What is the scale factor of this enlargement?

   c Copy and complete the enlargement and label it A'B'C'D'.

   d What is the relationship between the lengths of AD and A'D'?
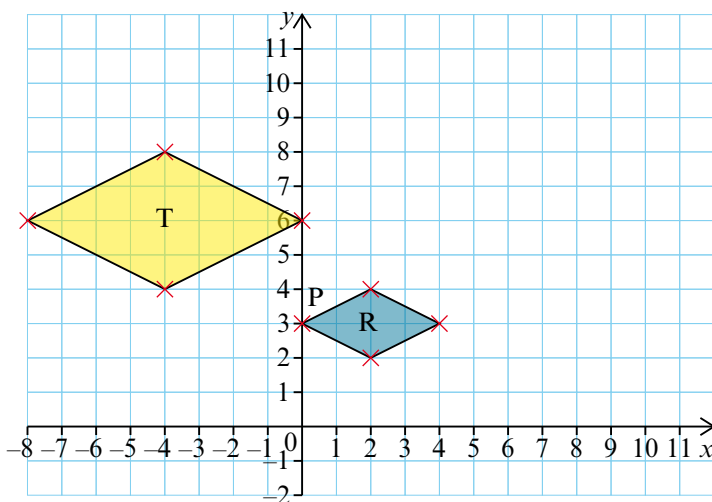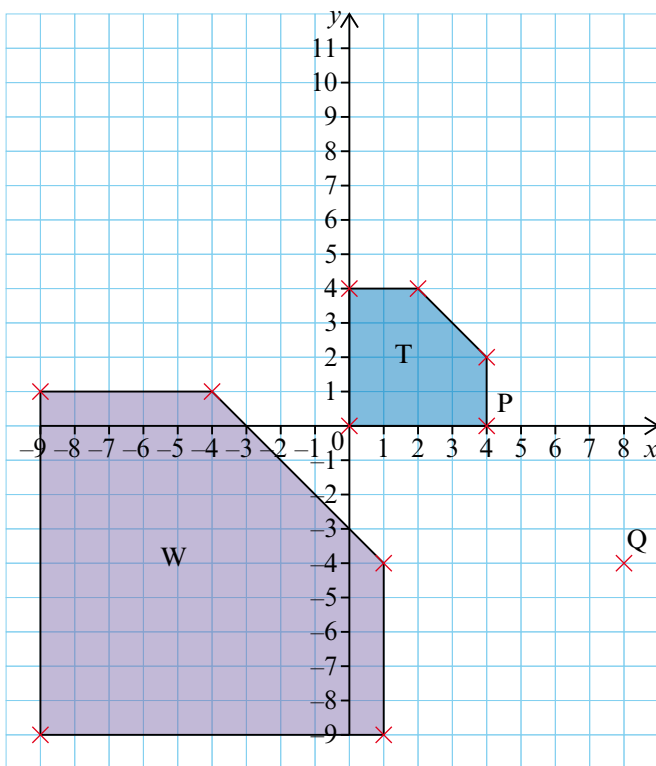

explanation 3a   explanation 3b   explanation 3c

11 The diagram shows two rhombuses, T and R.

   a Copy the diagram. Find the image of the vertex marked P (0, 3) under an enlargement scale factor 3, centre the origin. Label it P'.

   b Using P', find the image of the rhombus R under this enlargement and label it S.

   c The perimeter of the rhombus R is 8.9 units. What is the perimeter of S?

   d What is the scale factor of the enlargement that maps R to T?

   e Find the centre of this enlargement. Label it C.

12 The diagram shows two pentagons T and W.

a Copy the diagram. Find the image of the point P under an enlargement, scale factor 2, centre Q. Label this P'.

b Draw the image of the pentagon T under the enlargement, scale factor 2, centre origin. Label this V.

c What is the scale factor of the enlargement that maps the pentagon T to the pentagon W?

d Find the centre of the enlargement that maps T to W.

e The perimeter of T is 14.8 units. Explain how to find the perimeter of W.

13 Look at question **12**.

a Copy the shape T on the grid. Find the image of the vertex P under an enlargement, scale factor 1.5 and centre the origin.

b Draw the image of shape T under this enlargement and call the image S.