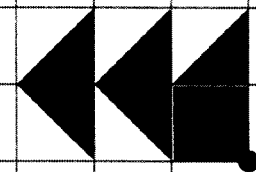
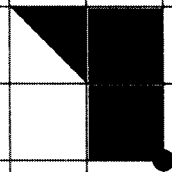
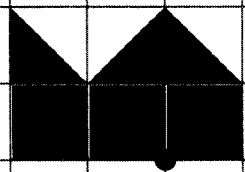
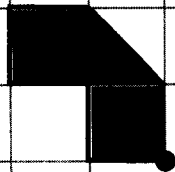
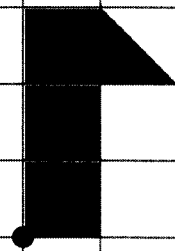
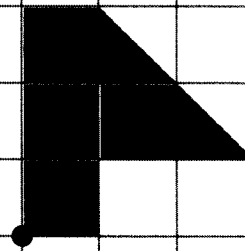
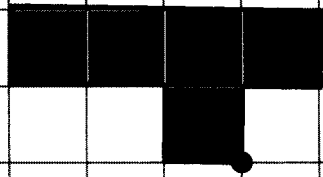
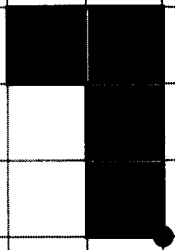


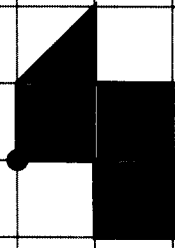
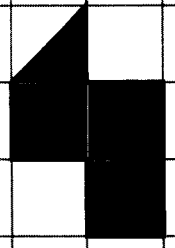
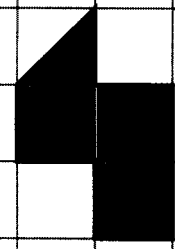
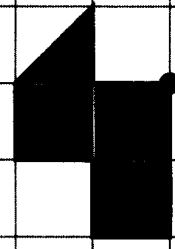
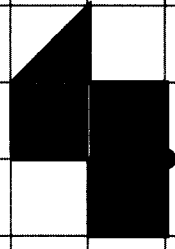
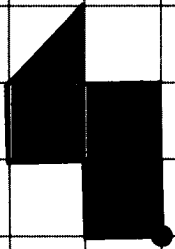
TRANSFORMATIONS

Page	Description
1	Rotations through 180°
2	Rotations through 180°
3	Translations
4	Enlargements
5	Reflections
6	Reflections on a grid with a diagonal mirror line
7	Mixed reflection, rotation and translation on a grid
8	Number of lines of symmetry and order of rotational symmetry
9	Enlargements on a grid with a centre of enlargement and a positive whole number scale factor
10	Enlargements on a grid with a centre of enlargement and a negative and/or fractional scale factor
11	Mixed reflection, rotation, enlargement and translation on a grid

Rotate the shape half a turn about the black dot



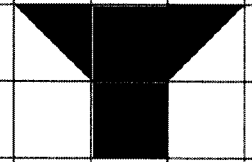
Rotate the shape half a turn about the black dot



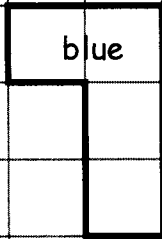
2

Translation Worksheet

+ right, - left
+ up, - down

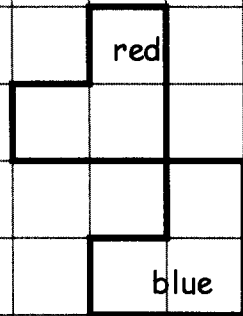


Translate this shape by
the vector

$$\begin{bmatrix} 3 \\ 1 \end{bmatrix}$$


blue

Translate this shape by
the vector

$$\begin{bmatrix} 0 \\ 3 \end{bmatrix}$$


red

blue

Translate this shape by
the vector

$$\begin{bmatrix} -3 \\ -2 \end{bmatrix}$$

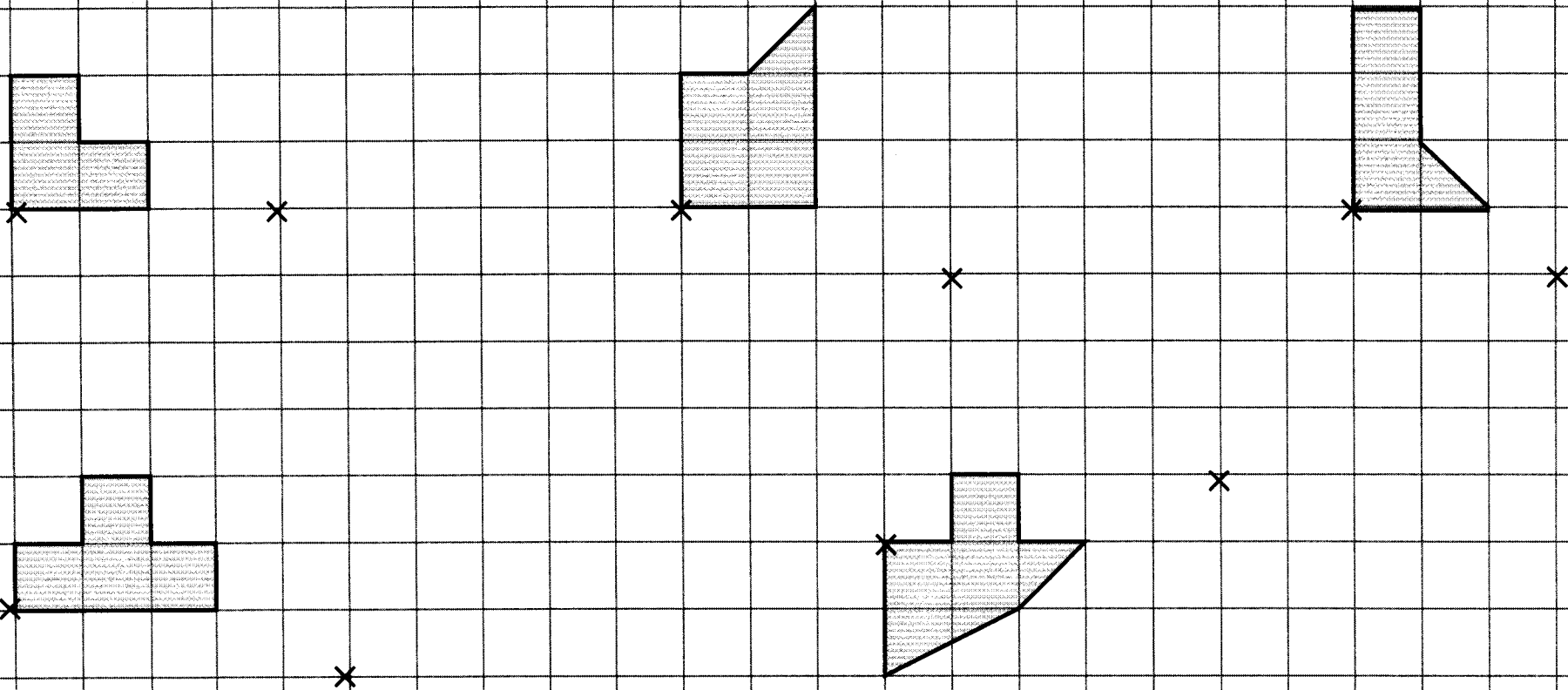

blue



red

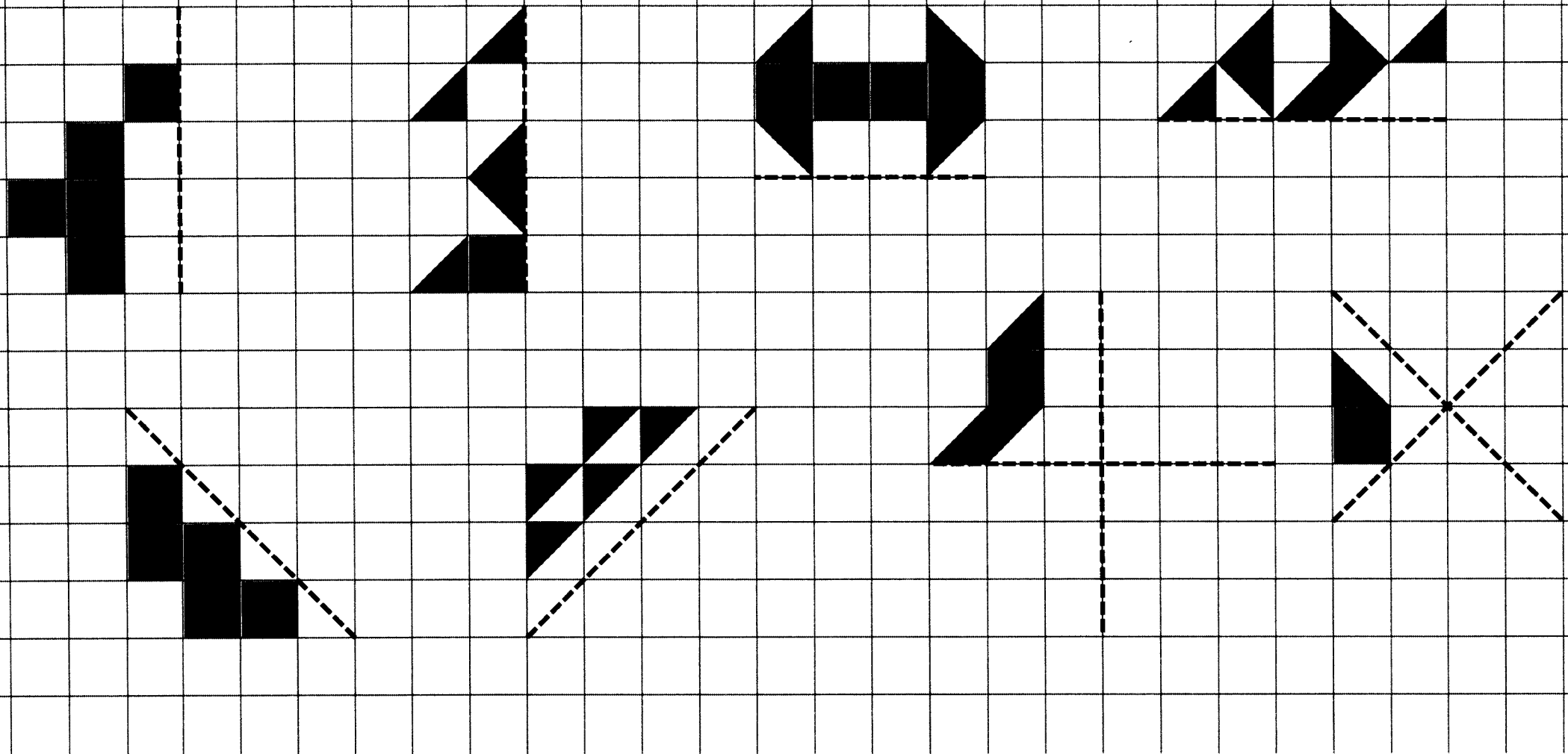
Colour the red shape red and the blue shape blue. Describe the translation, using a vector, moving from the red shape to the blue shape.

Draw an enlargement of each, scale factor 2. Start at the x

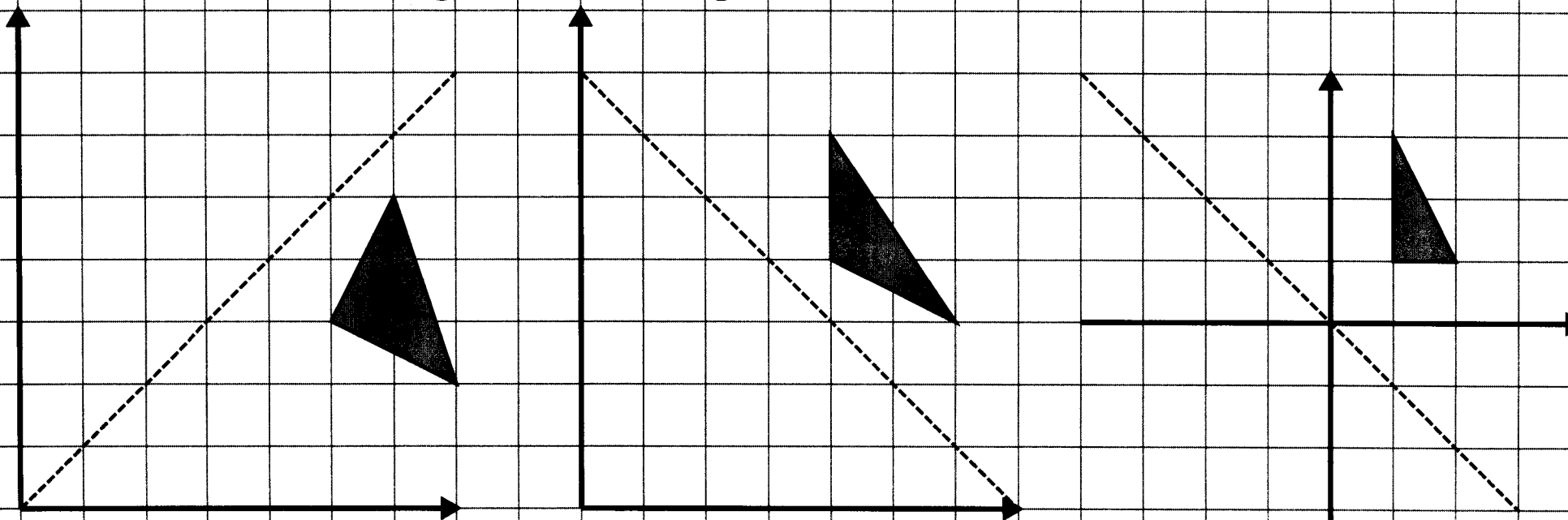


Enlargement - Enlarge each of these shapes by scale factor 2 Start at the "x"

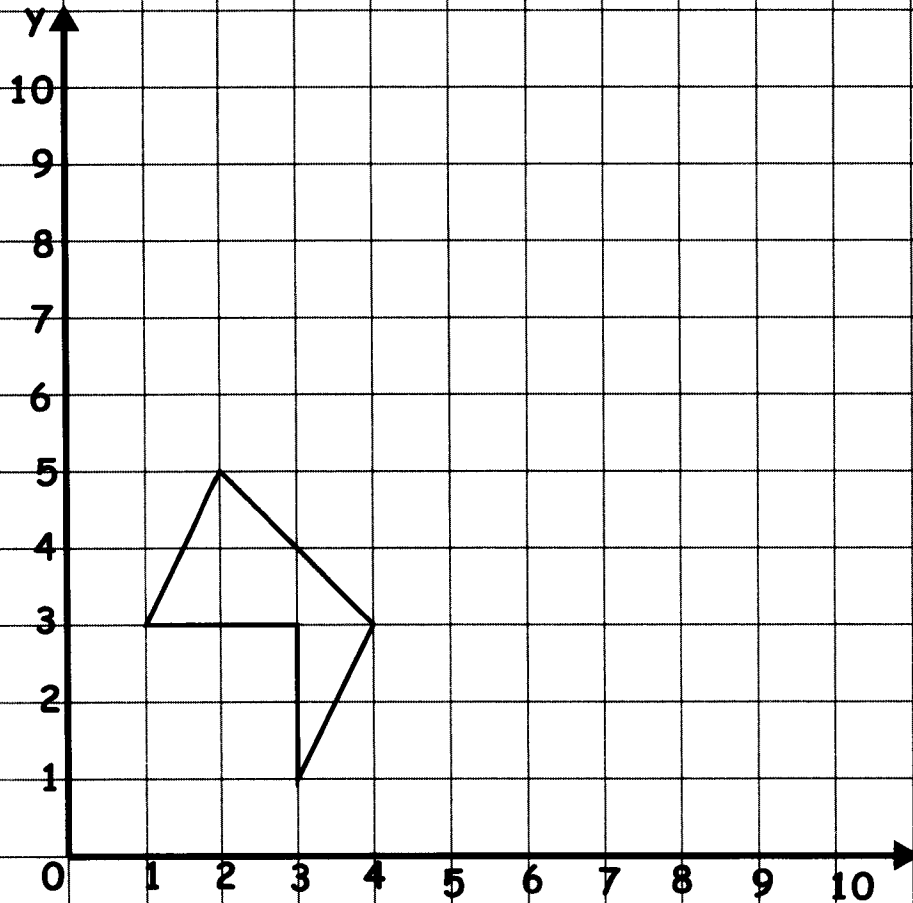
Reflect these shapes in the mirror line



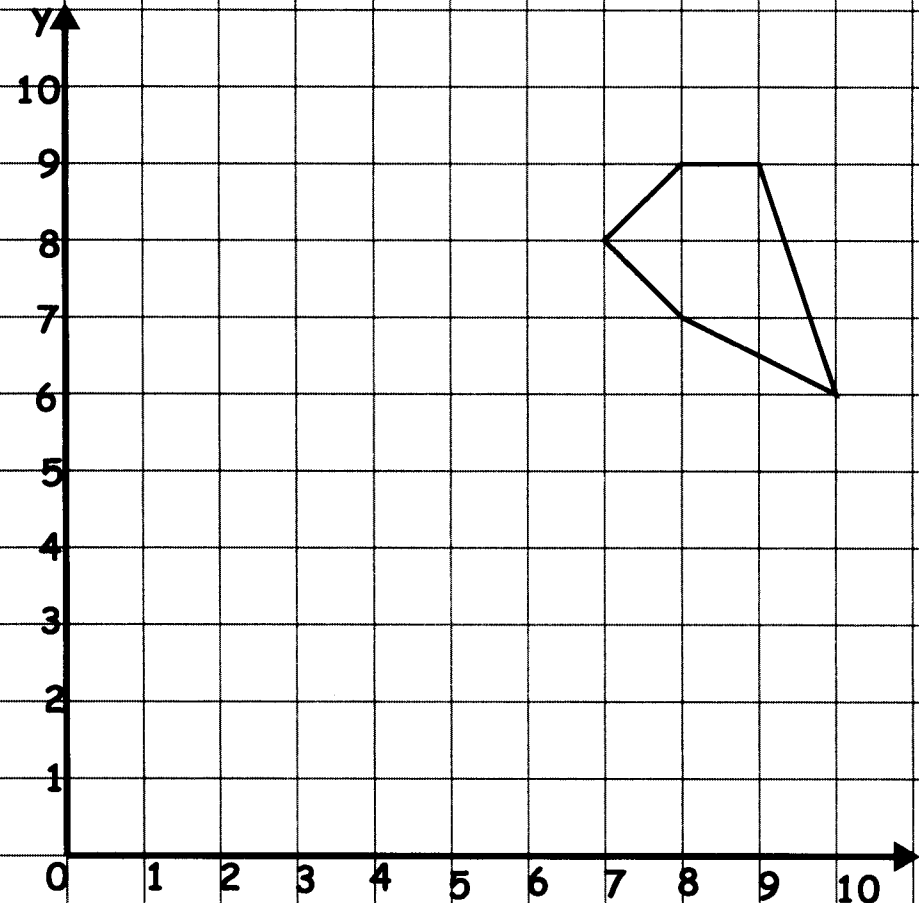
Reflect the triangles in the diagonal mirror lines



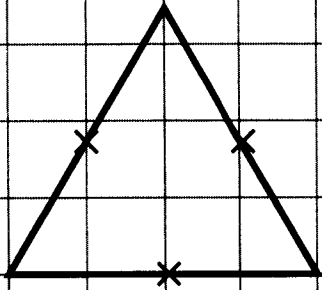
⑥



- 1) Reflect the original shape in $x = 5$
- 2) Translate the original shape 6 right, 4 up.
- 3) Rotate the original shape 90 degrees clockwise about the point (5,5)

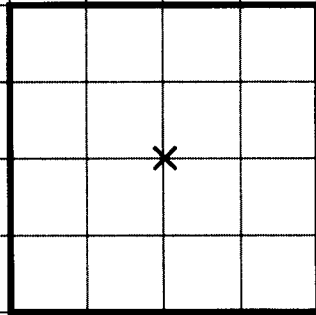


- 1) Reflect the original shape in $y = 6$
- 2) Translate the original shape 4 left, 3 down.
- 3) Rotate the original shape 90 degrees anticlockwise about the point (6,6)



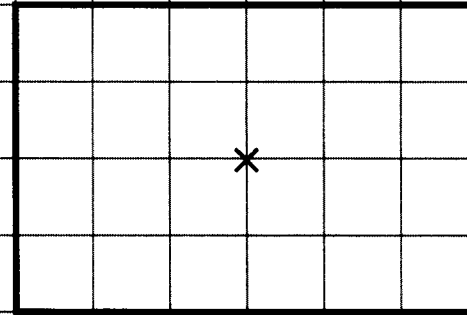
Lines of symmetry =

Order of rotational symmetry =



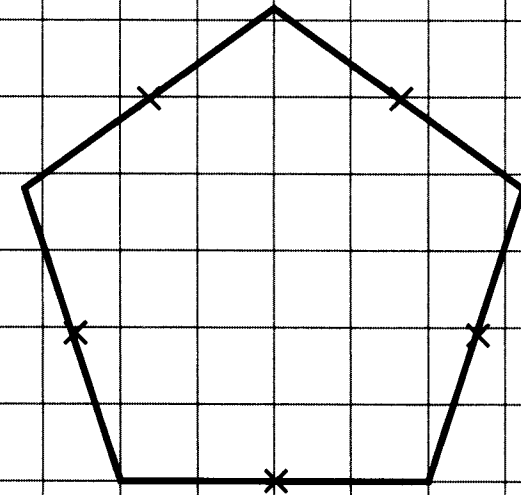
Lines of symmetry =

Order of rotational symmetry =



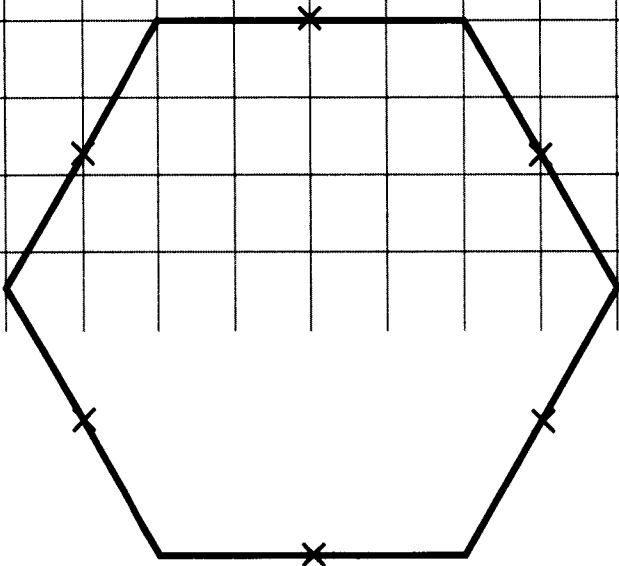
Lines of symmetry =

Order of rotational symmetry =



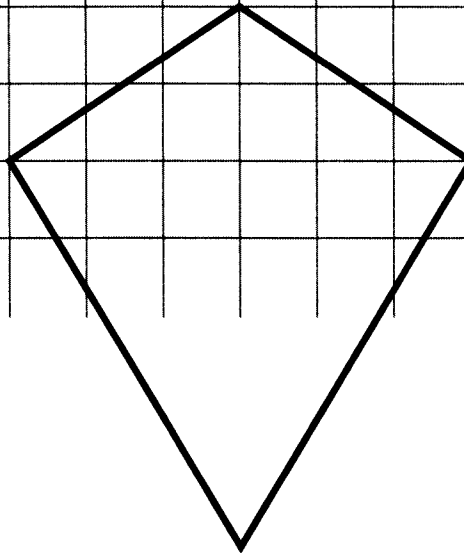
Lines of symmetry =

Order of rotational symmetry =



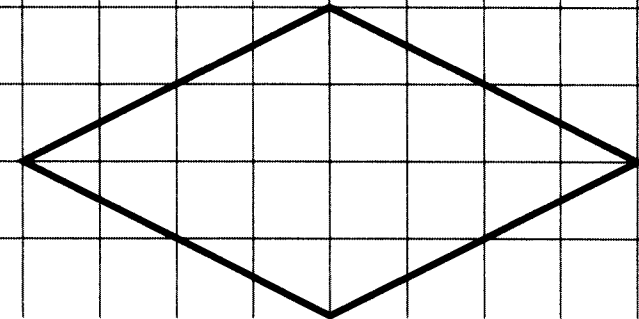
Lines of symmetry =

Order of rotational symmetry =



Lines of symmetry =

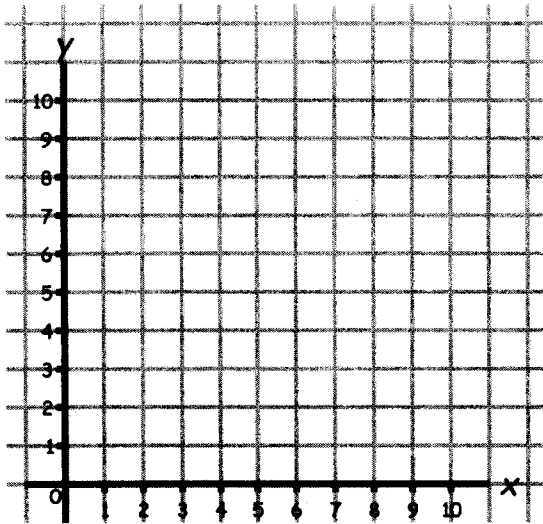
Order of rotational symmetry =



Lines of symmetry =

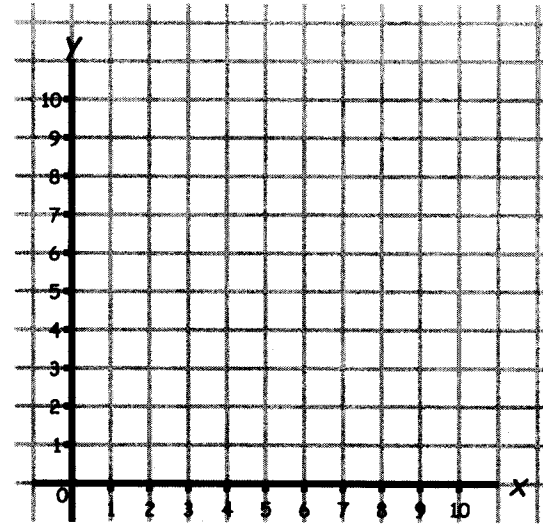
Order of rotational symmetry =

Enlargement on a grid with a positive scale factor



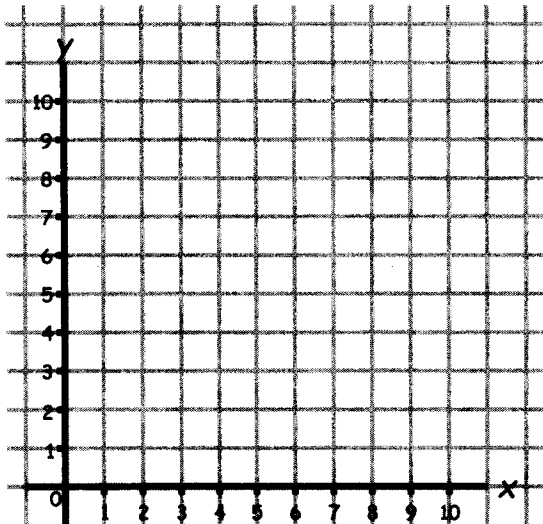
Plot the points $(1,1)$ $(3,1)$
and $(1,3)$. Join them to make
a triangle.

Enlarge this triangle by
a scale factor 3, centre of
enlargement $(0,0)$



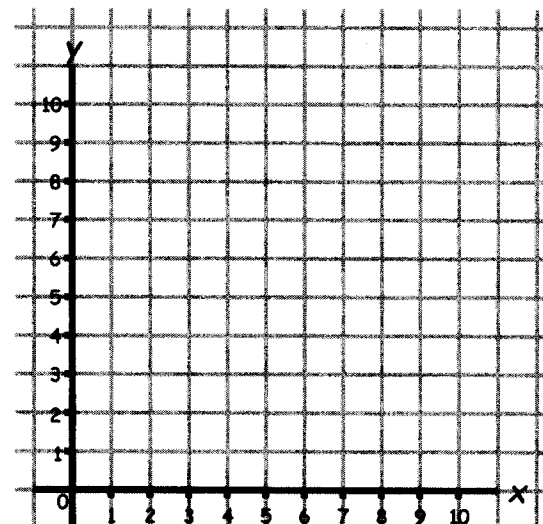
Plot the points $(2,4)$ $(7,3)$
and $(4,7)$. Join them to make
a triangle.

Enlarge this triangle by
a scale factor 2, centre of
enlargement $(4,4)$



Plot the points $(6,10)$ $(9,7)$
and $(7,7)$. Join them to make
a triangle.

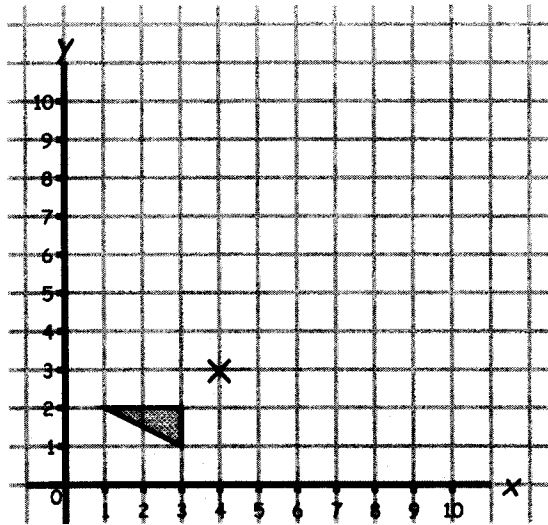
Enlarge this triangle by
a scale factor 2, centre of
enlargement $(10,10)$



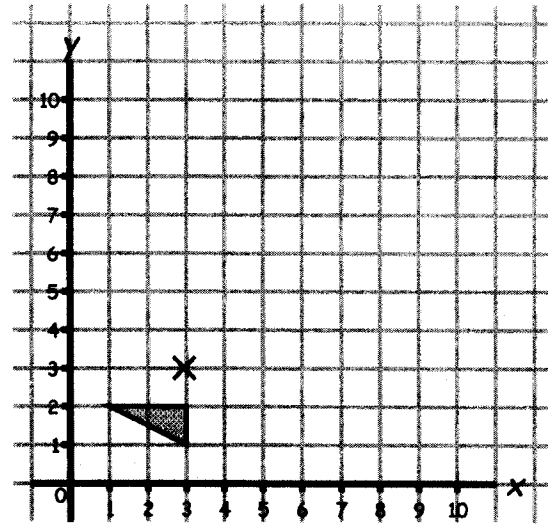
Plot the points $(9,1)$ $(10,3)$
and $(8,3)$. Join them to make
a triangle.

Enlarge this triangle by
a scale factor 4, centre of
enlargement $(10,1)$

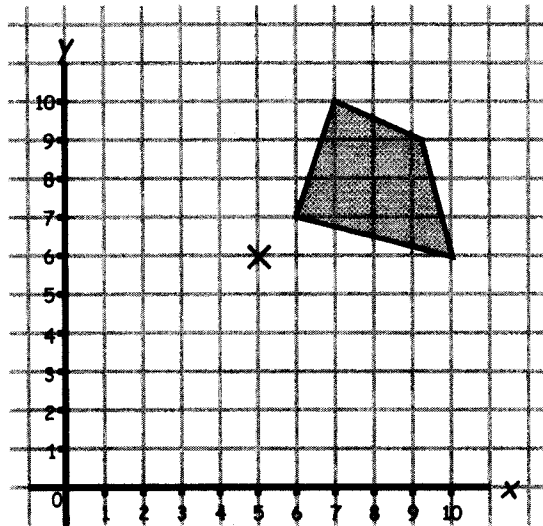
Enlarge by scale factor -2 , centre of enlargement $(4,3)$



Enlarge by scale factor -3 , centre of enlargement $(3,3)$



Enlarge by scale factor -1 , centre of enlargement $(5,6)$



Enlarge by scale factor $-\frac{1}{2}$, centre of enlargement $(5,4)$

