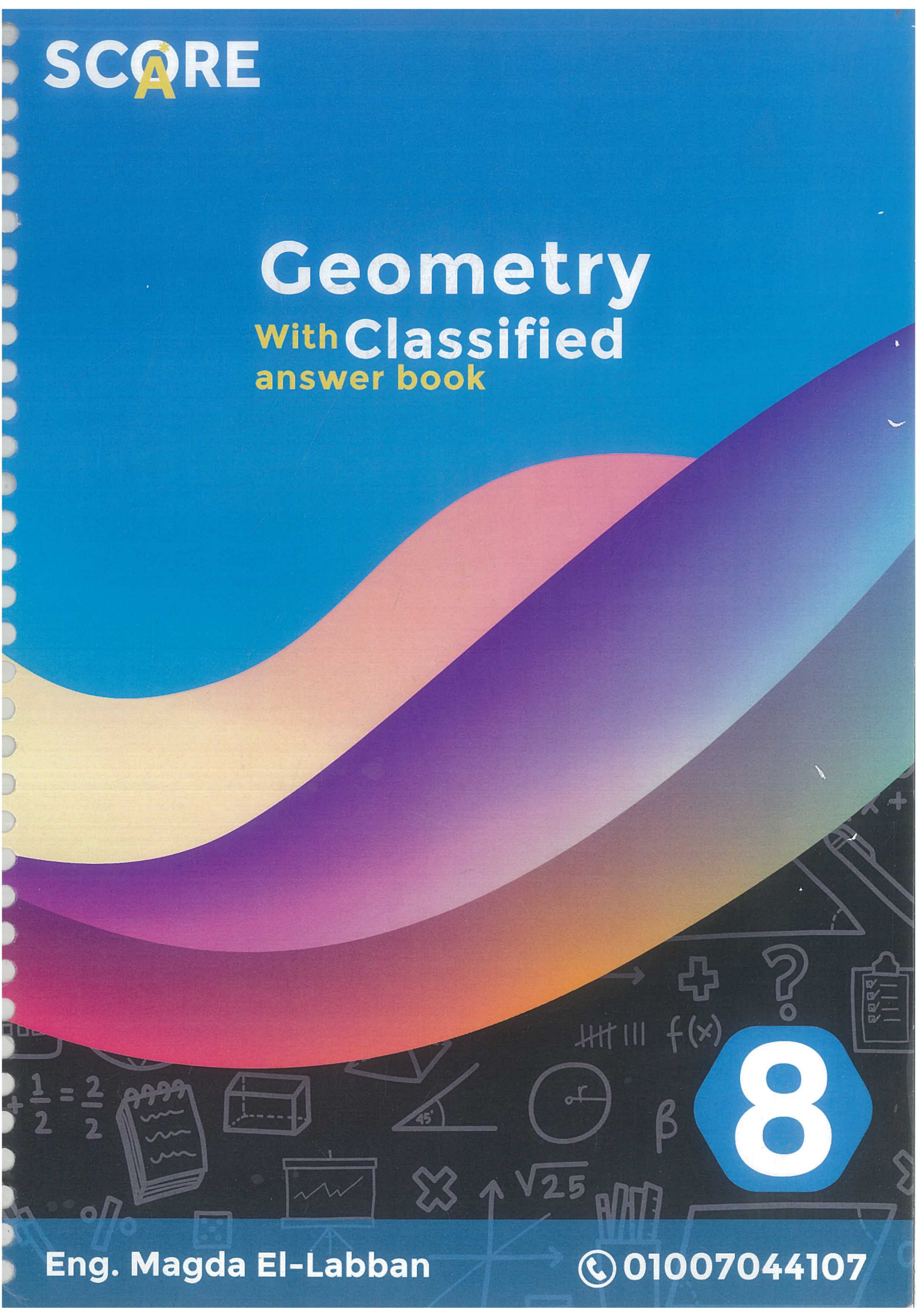
SCORE

Geometry

With Classified answer book

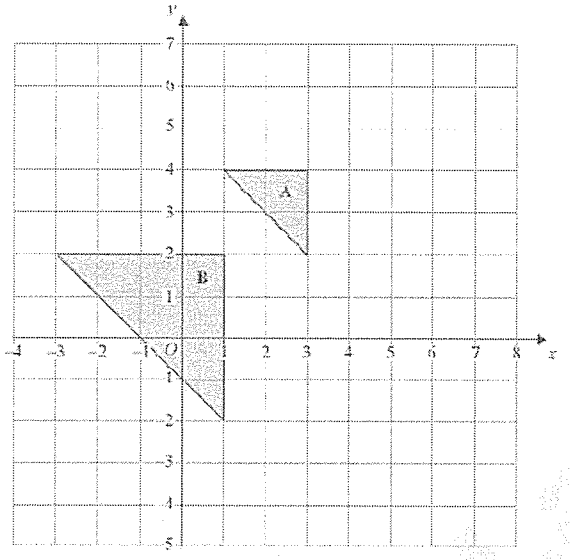


Eng. Magda El-Labban

01007044107

17- Mixed transformations

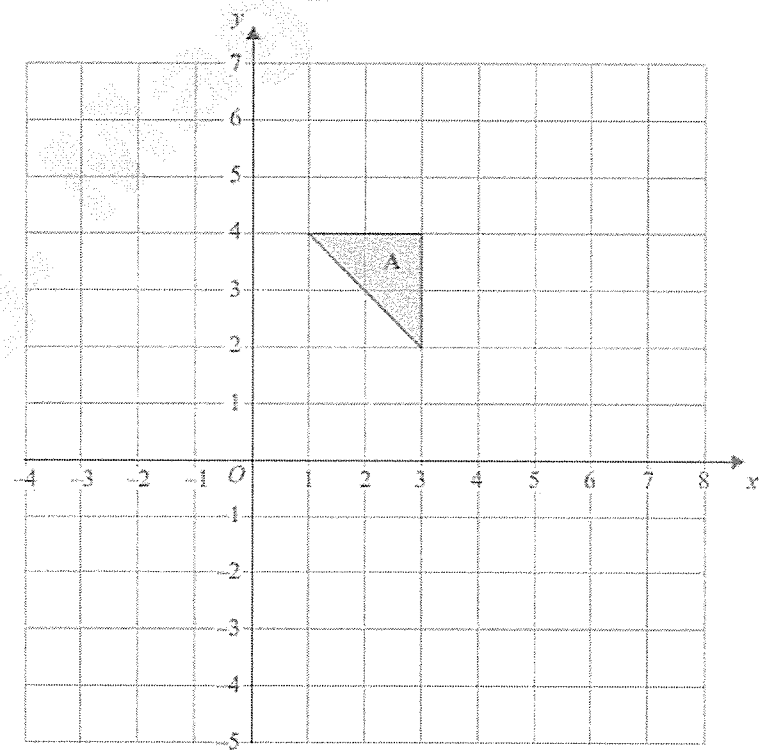
1. Triangle **A** and triangle **B** are drawn on the grid.



Describe fully the single transformation which maps triangle A onto triangle B.

2. (a) Reflect triangle **A** in the line $x = 4$ label it B

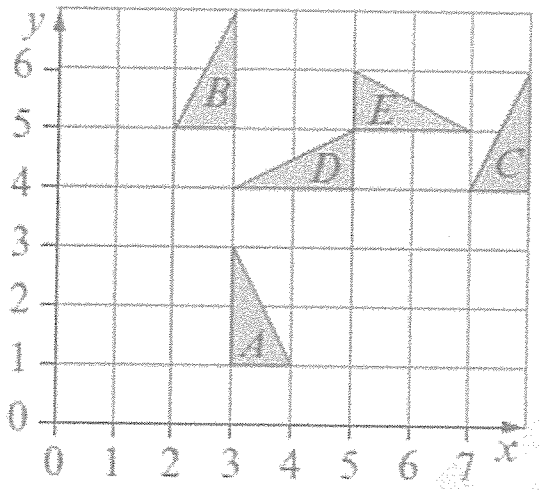
(b) Reflect triangle **B** in the line $Y = 1$ label it C



3. The diagram shows five triangles, A, B, C, D and E.

Look at the following combinations of transformations.

Name the object triangle and the image triangle for each transformation.



a) A reflection in the line $x = 4$, followed by a translation $\begin{pmatrix} 3 \\ 3 \end{pmatrix}$.

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b) A rotation 180°, centre (3, 3), followed by a reflection in the line $y = 5$.

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c) A translation $\begin{pmatrix} -2 \\ -1 \end{pmatrix}$, followed by a rotation 90° anticlockwise, centre (1, 4).

.....

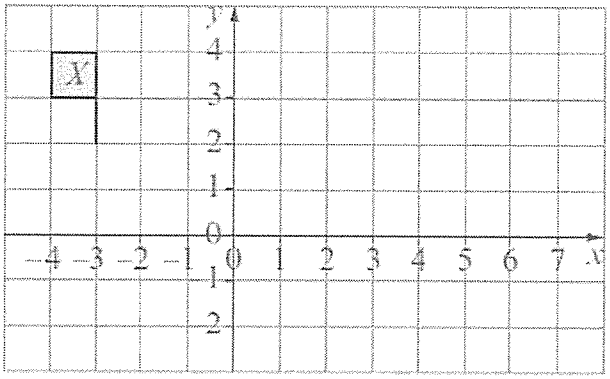
d) A rotation 90° clockwise, centre (3, 5), followed by a translation $\begin{pmatrix} 2 \\ 0 \end{pmatrix}$.

.....

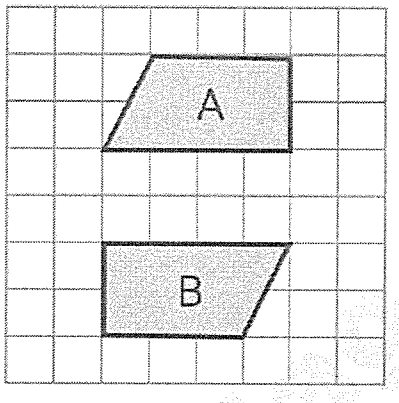
4. The diagram shows shape X. Make a copy of the diagram.
Draw the image of X after a reflection in the line x = −1,

Followed by a rotation of 90° clockwise about the point (−2, 1) ,

followed by a translation, $\begin{pmatrix} 4 \\ 3 \end{pmatrix}$ followed by a reflection in the line y = 1,
Label the image Y.



5. For each diagram decide whether B is a reflection or a rotation of A.



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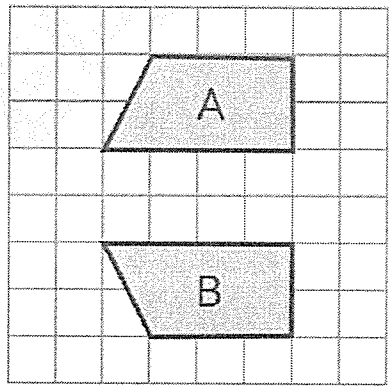

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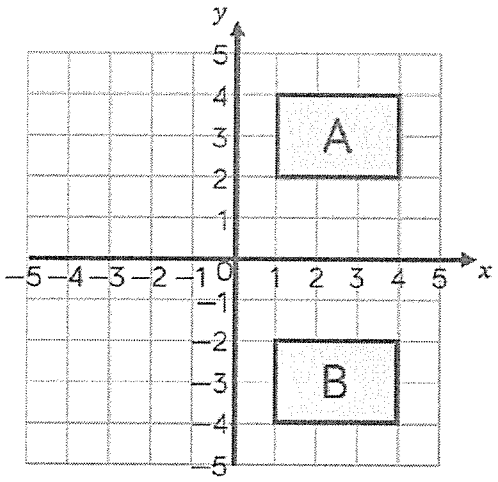
6. A transformation has been performed on shape A to give shape B.

Ron says "Shape B is a reflection of shape A"

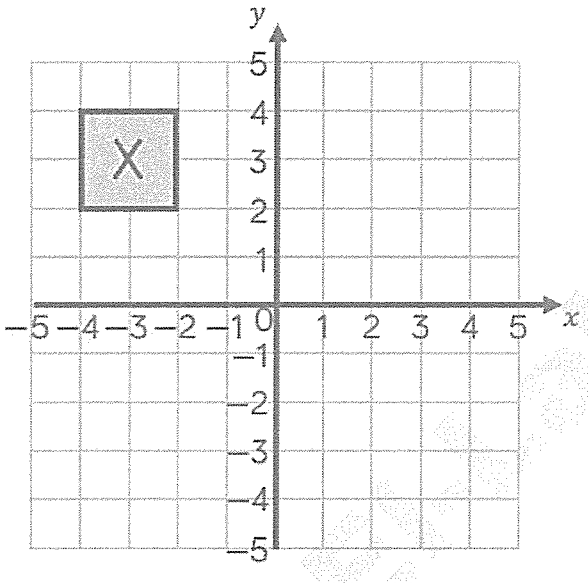
Dora says "Shape B is a rotation of shape A"

Who do you agree with? Explain why.



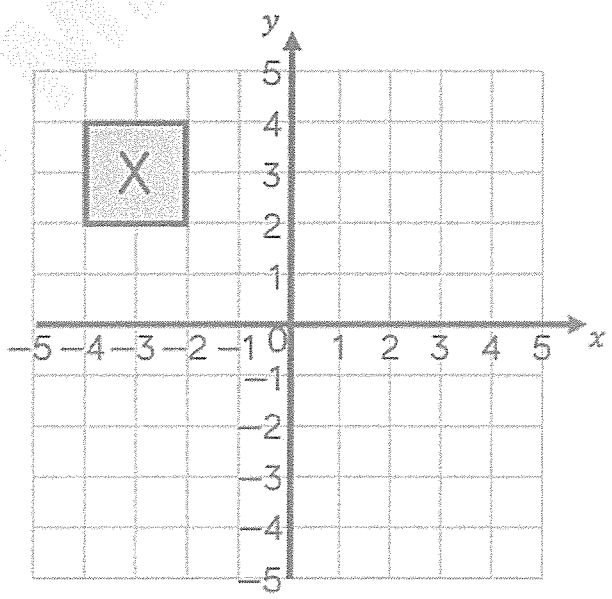
7. Reflect X in the line X = -2

Write down the coordinates of each vertex of the image.
Rotate X 180° about (−2, 2)
Write down the coordinates of each vertex of the image.
Which vertices remain invariant under each transformation?



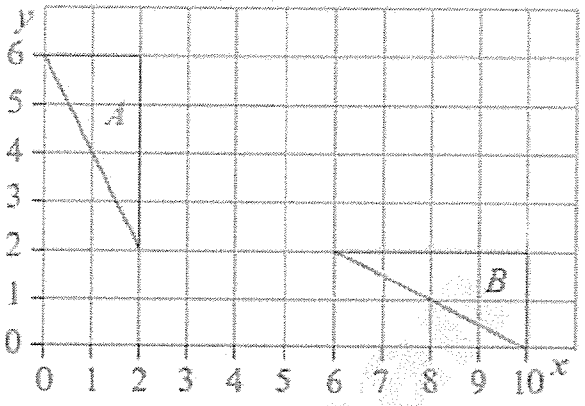
8. Rotate X 90° clockwise using the origin as the centre of rotation.

Label this shape Y.
Reflect shape Y in the X axis. Label this shape Z.
Investigate what would happen if the transformations were performed in a different order.



9. Zara and Arun are discussing this diagram.

It shows two shapes, A and B.



Zara says:

I can transform shape A to shape B by reflecting it in the line $x = 3$ and then rotating it 90° clockwise, centre (4, 2).

Arun says:

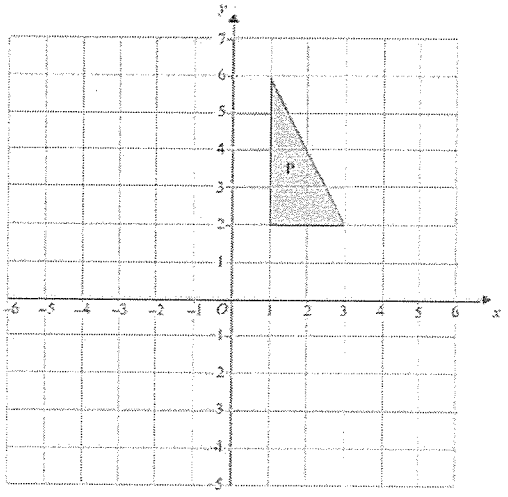
I can transform shape A to shape B by rotating it 90° anticlockwise, centre (4, 4), then reflecting it in the line $x = 6$

Is either of them correct? Draw diagrams to explain how you worked out your answer.

10. Triangle **P** is drawn on a coordinate grid.

The triangle **P** is reflected in the line $x = -1$ and then reflected in the line $y = 1$ to give triangle **Q**.

Describe fully the single transformation which maps triangle **P** onto triangle **Q**.



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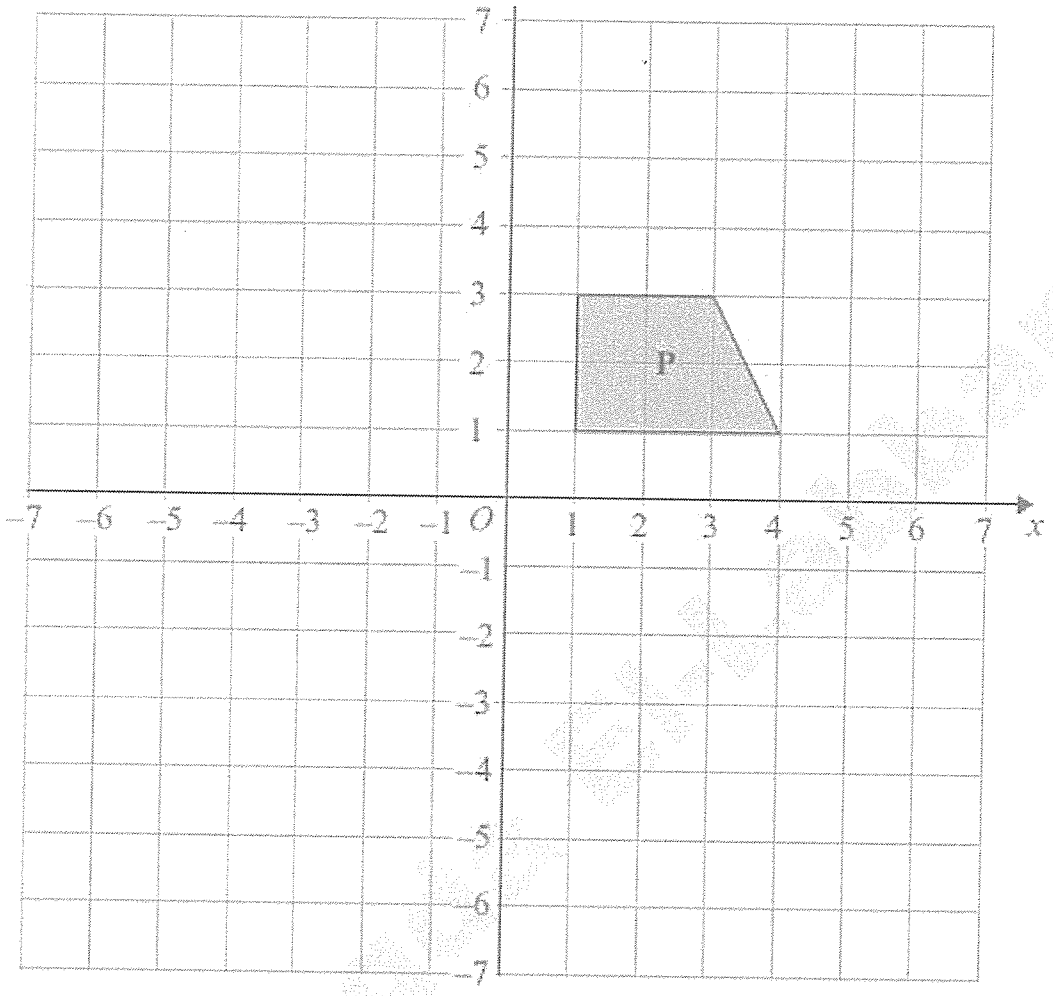
11.



Shape **P** is reflected in the line $x = -1$ to give shape **Q**.

Shape **Q** is reflected in the line $y = 0$ to give shape **R**.

Describe fully the **single** transformation that maps shape **P** onto shape **R**.

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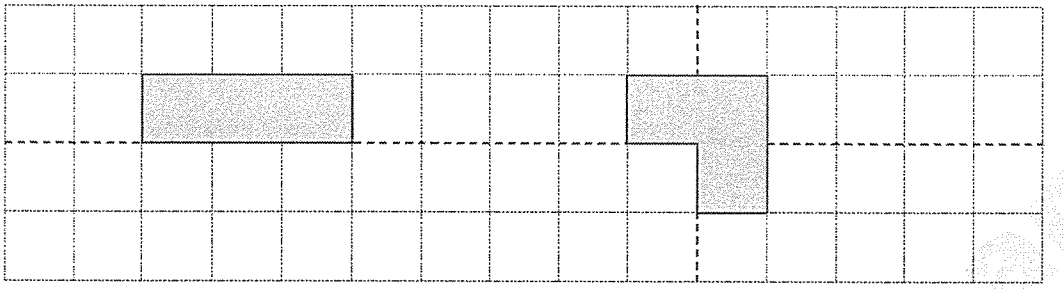
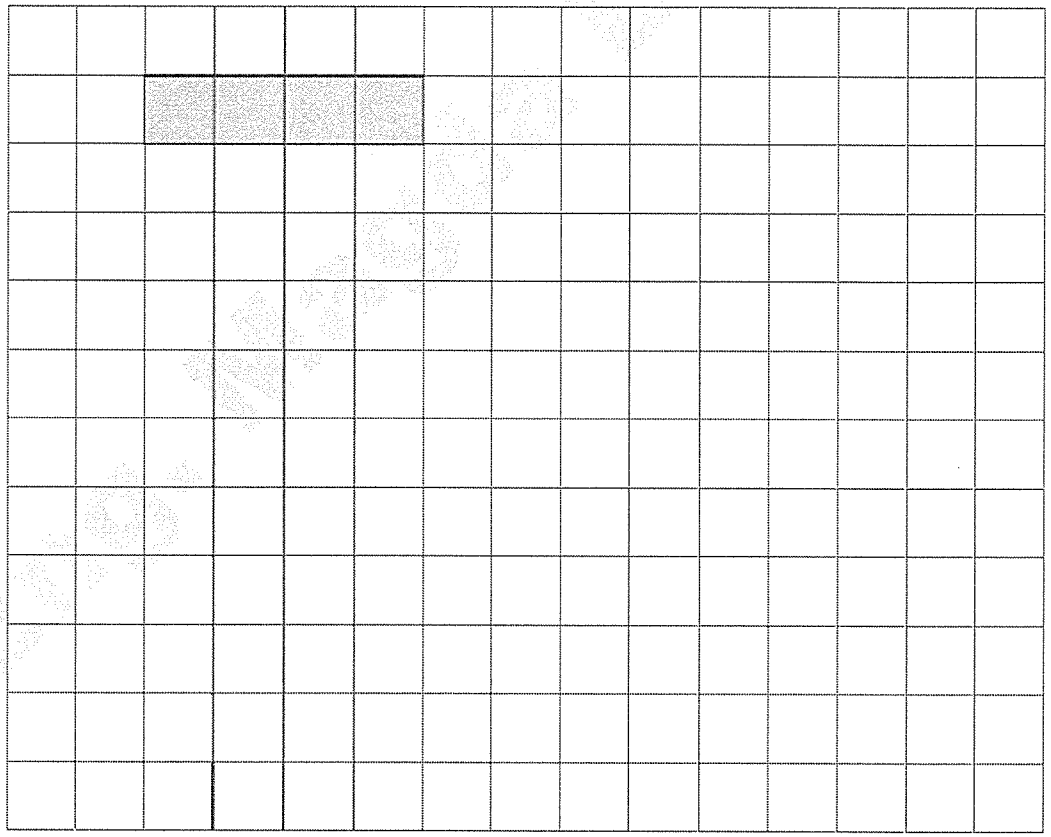
12. Without reflections or rotations,
three squares can join side-to-side to make only **two different** shapes.



Square grid

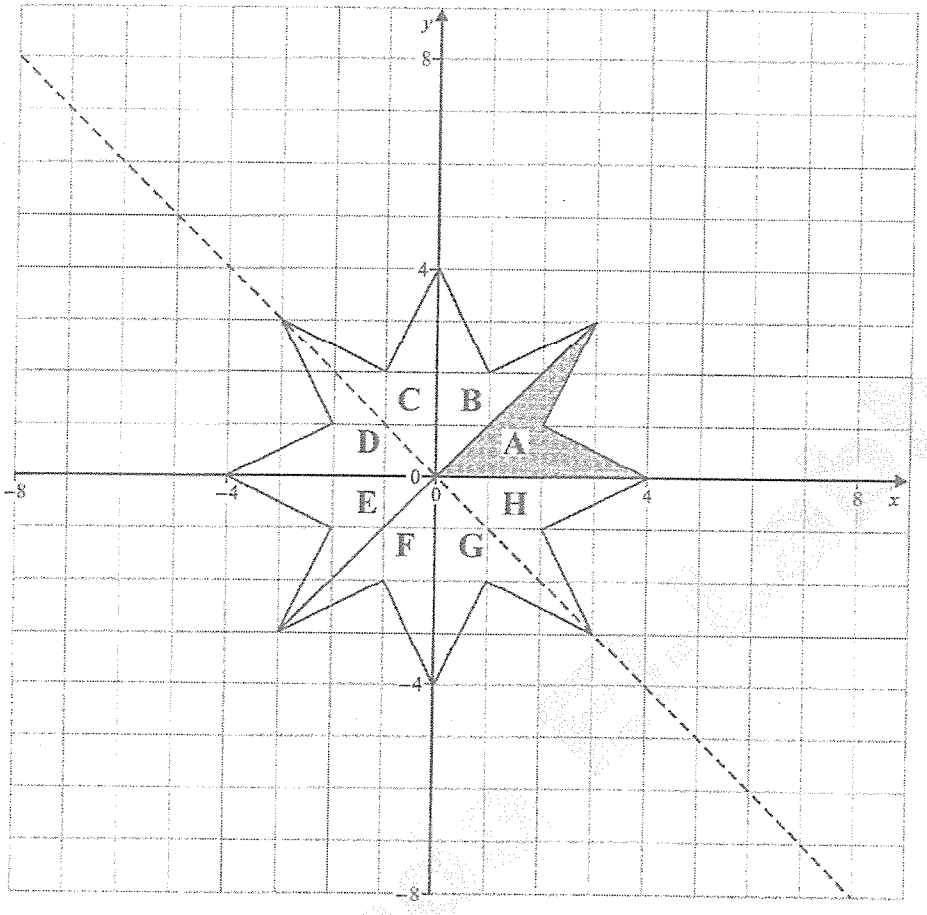
Without reflections or rotations,
four squares can join side-to-side to make only **five different** shapes.

Complete the five different shapes on the grid below.
The first one is done for you.



Square grid

13. In the diagram shape **A** is shaded.



(a)(i) Shape **A** is reflected in the *x* axis.
Write down the letter of the shape which shows its new position.

Answer .....

(ii) Shape **A** is rotated through 90^0 in a clockwise direction about (0, 0).
Write down the letter of the shape which shows its new position.

Answer .....

(iii) Shape **A** is reflected in the dotted line shown in the diagram.
Write down the letter of the shape which shows its new position.

Answer .....

(b) Shape **A** is translated using the vector $\begin{bmatrix} 4 \\ 0 \end{bmatrix}$
Draw the new position of shape **A** and label it **Y**.

18- Surface Area

1. The diagram shows a cuboid of dimensions 10cm × 8cm × 5cm.

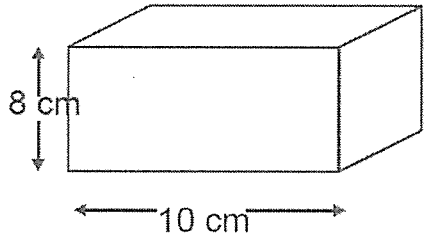


Diagram **NOT** accurately drawn Work out the total surface area of the cuboid.

State the units with your answer.

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2. The diagram shows a solid cuboid which is 5 cm by 4 cm by 3 cm.

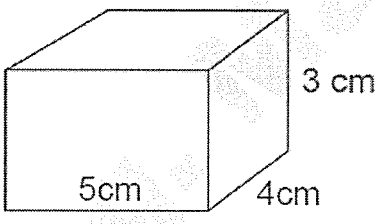

Diagram **NOT** accurately drawn What is the total surface area of this cuboid? State the units with your answer.

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