

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Examiner's Use	
Examiner's Initials	
Pages	Mark
2–3	
4–5	
6–7	
8–9	
10–11	
TOTAL	

In the style of



General Certificate of Secondary Education  
Foundation Tier

# Mathematics

**43601F**

Past Paper Questions by Topic

## Transformations

**F**

For this paper you must have:

- mathematical instruments.

You must **not** use a calculator.



### Time allowed

- 1 hour 15 minutes

### Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book.

### Information

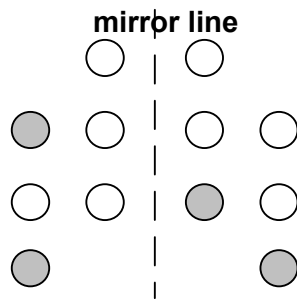
- The marks for questions are shown in brackets.
- The maximum mark for this paper is .
- The quality of your written communication is specifically assessed in questions indicated with an asterisk (\*)
- You may ask for more answer paper and graph paper. These must be tagged securely to this answer booklet.

### Advice

- In all calculations, show clearly how you work out your answer.

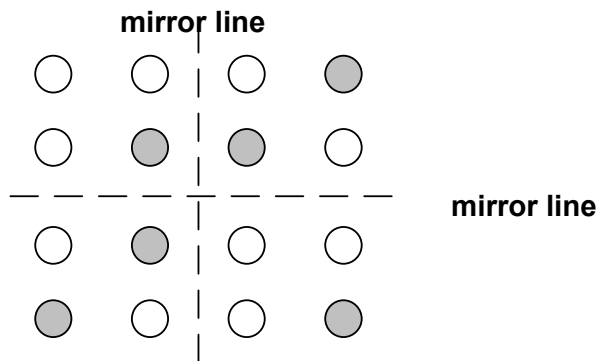
1 Here are some patterns of circles.

1 (a) Shade **four** more circles to give this pattern symmetry in the mirror line.



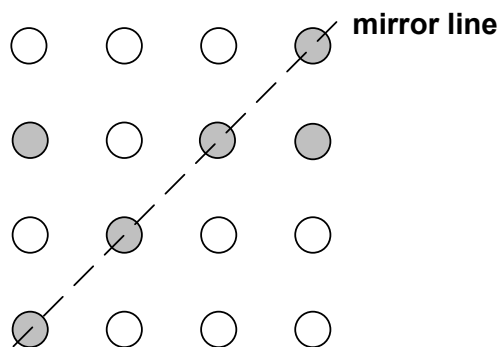
(2 marks)

1 (b) Shade **two** more circles to give this pattern symmetry in both mirror lines.



(2 marks)

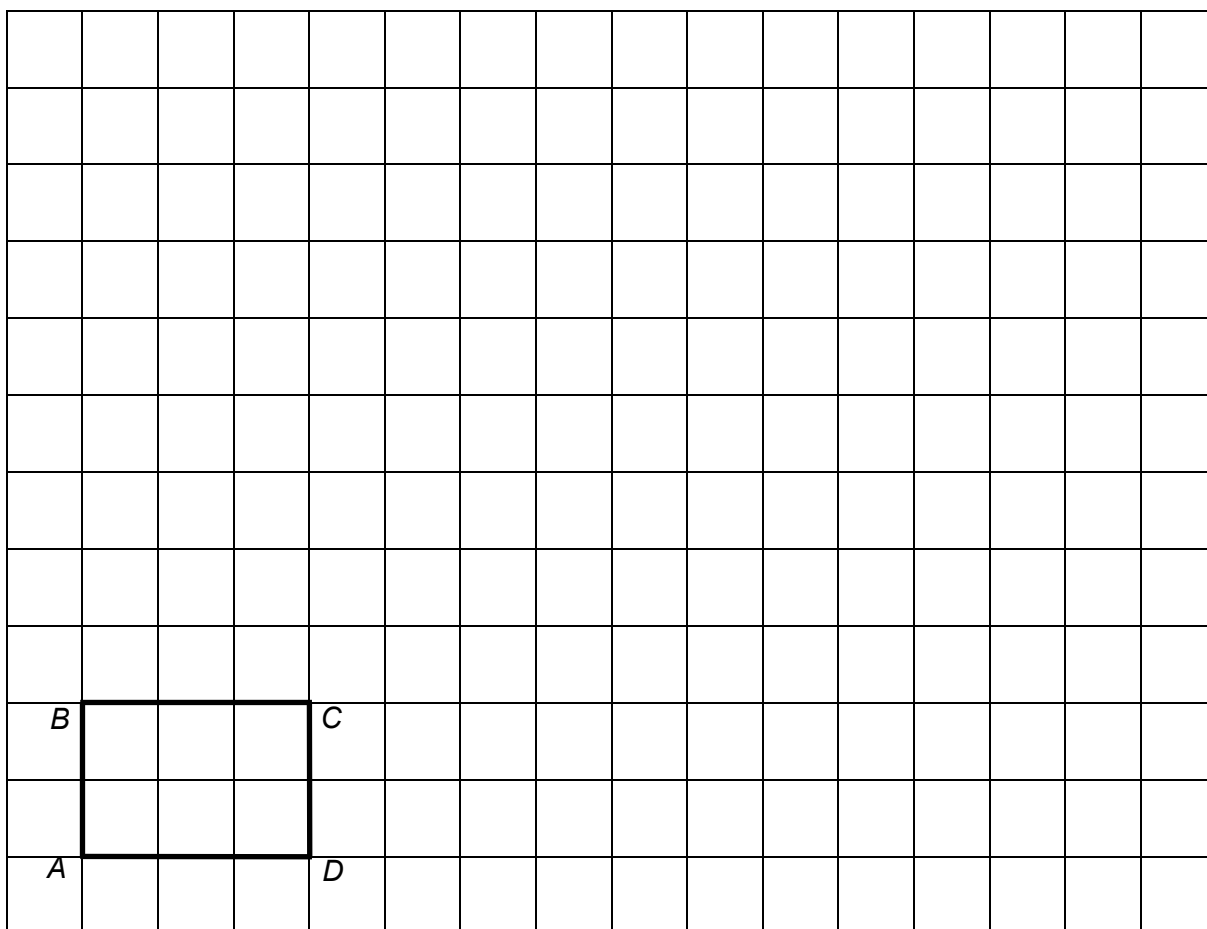
1 (c) Shade **two** more circles to give this pattern symmetry in the mirror line.



(2 marks)



2 The shape  $ABCD$  is drawn on a grid.



2(a) Enlarge  $ABCD$  by scale factor 3.

(2 marks)

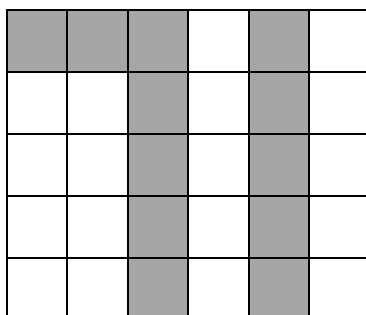
2(b) How many times bigger is the area of the enlarged shape than the area of  $ABCD$ ?

.....

Answer ..... (2 marks)



**3** The number 71 is shaded on the grid.



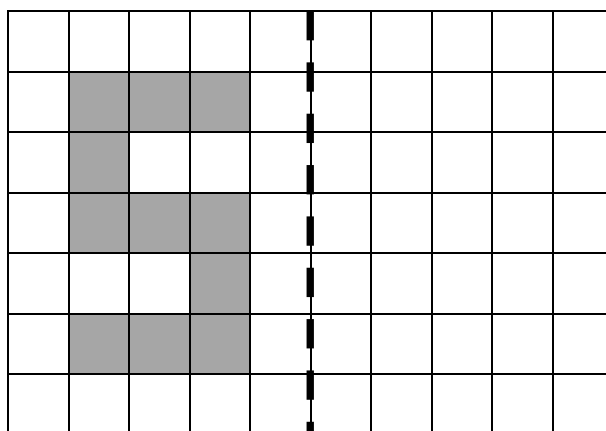
**3 (a)** What fraction of the grid is shaded?

Give your answer in its simplest form.

.....  
.....

Answer ..... (3 marks)

**3 (b)** The letter S is shaded on this grid.



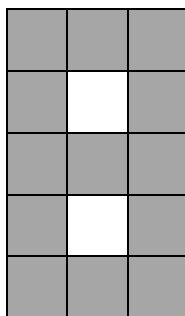
**mirror line**

Draw the reflection of the letter S in the mirror line.

(2 marks)



3 (c) The number eight is drawn.

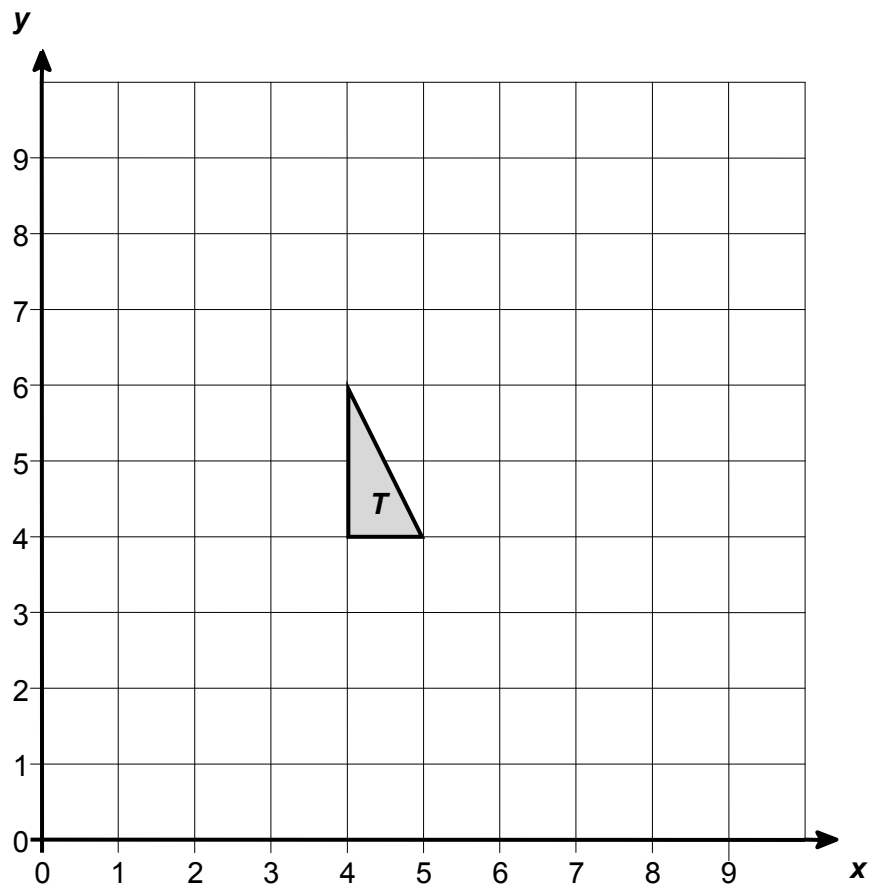


Write down the order of rotational symmetry.

Answer ..... (1 mark)



4 Triangle  $T$  is shown on the grid.

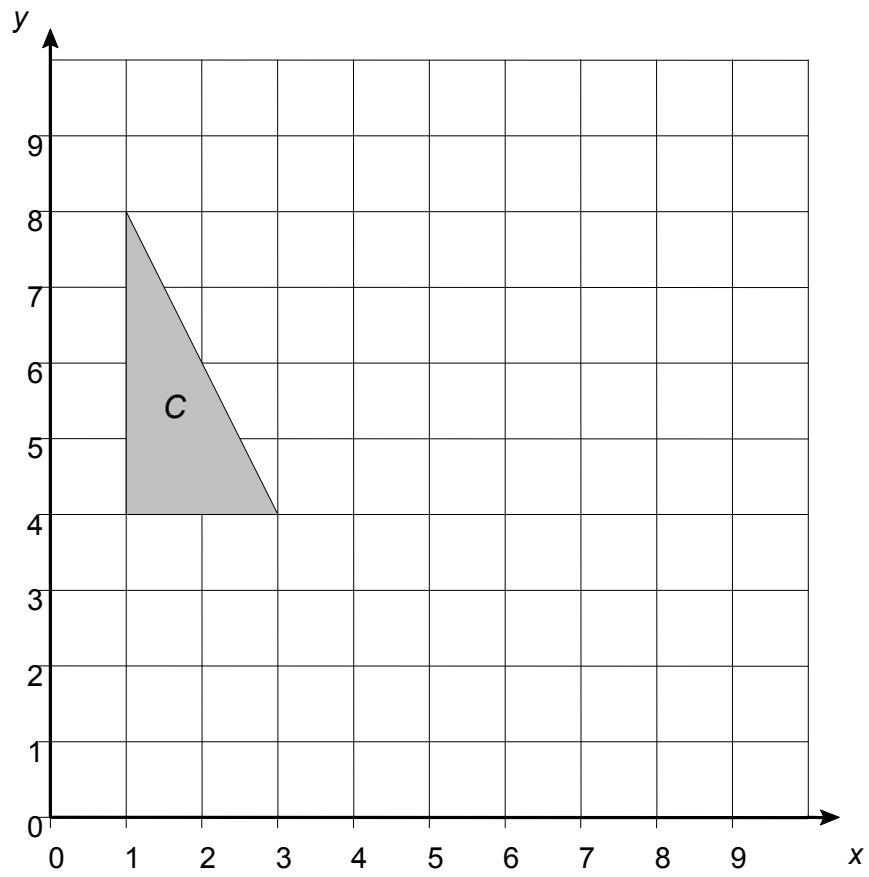


Translate triangle  $T$  by vector  $\begin{pmatrix} -2 \\ 3 \end{pmatrix}$

(2 marks)



5 (a) The diagram shows shape C.

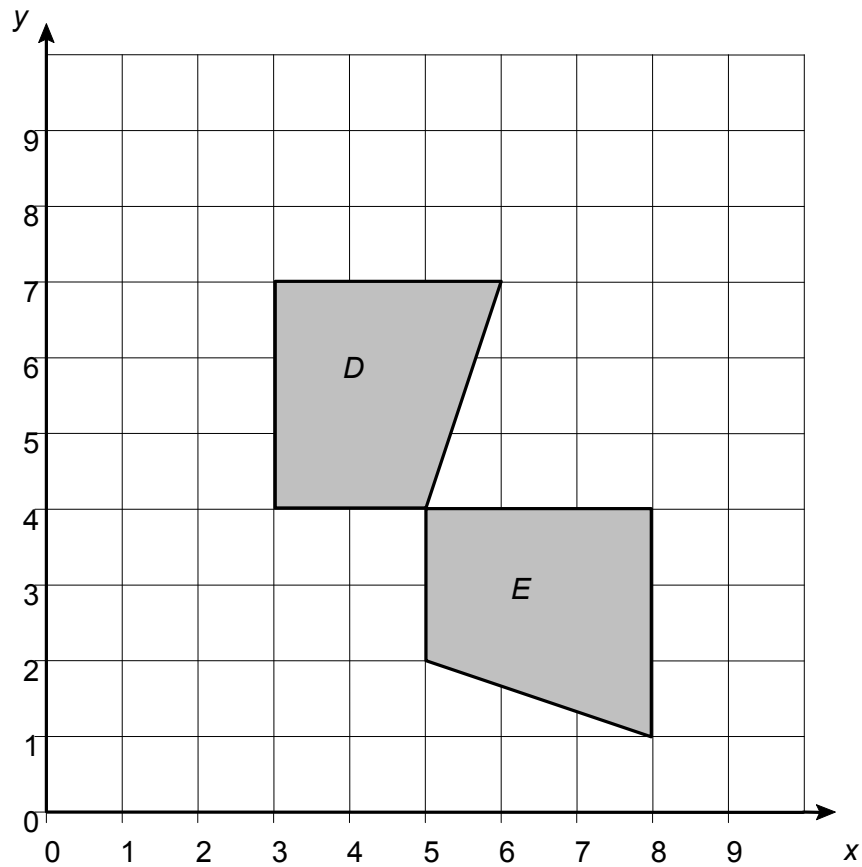


Reflect shape C in the line  $y = 4$

(2 marks)



5 (b) The diagram shows two shapes  $D$  and  $E$ .



Describe fully the **single** transformation which takes shape  $D$  to shape  $E$ .

.....

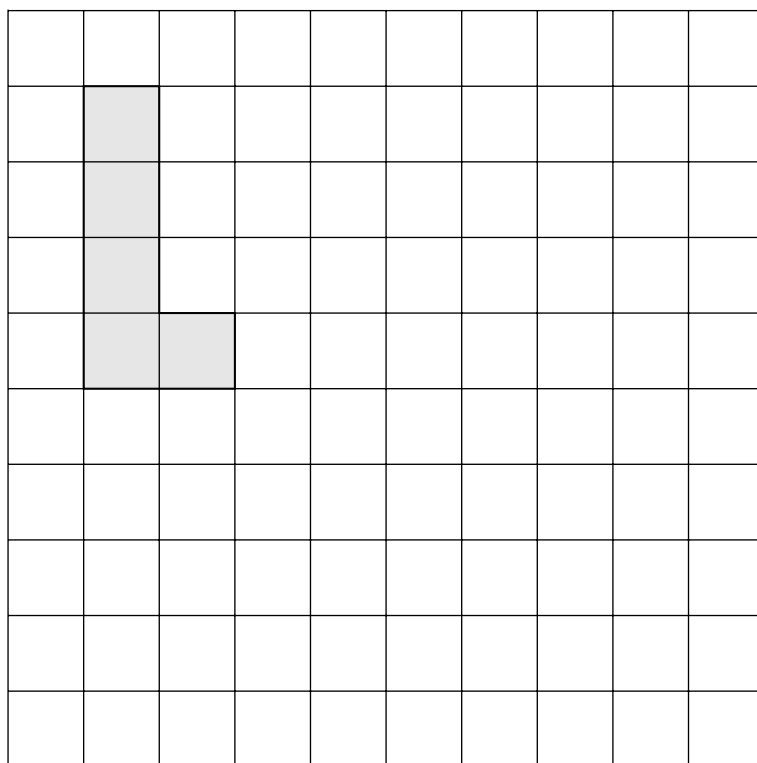
.....

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(3 marks)



6 (a) Shape  $L$  has an area of  $5\text{ cm}^2$ .



Work out the area of the shape after an enlargement of scale factor 2

.....

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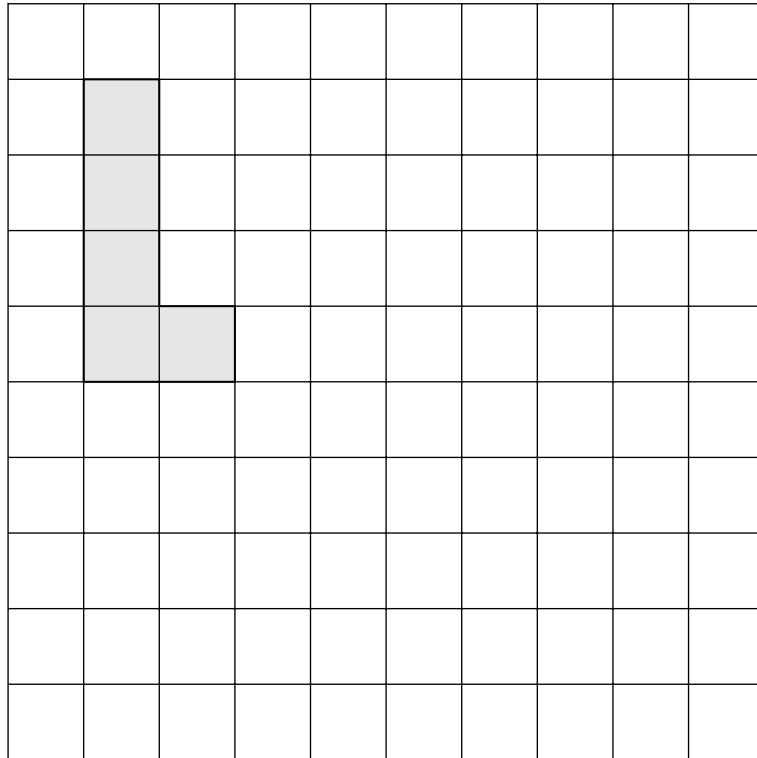
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Answer .....  $\text{cm}^2$  (2 marks)



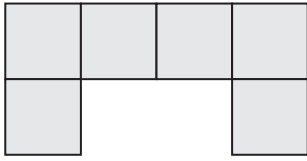
- 6 (b)** Rotate the shape clockwise by a quarter of a turn.  
Mark with a cross your centre of rotation.



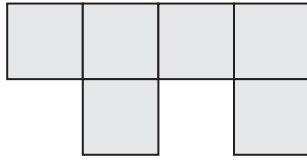
*(3 marks)*



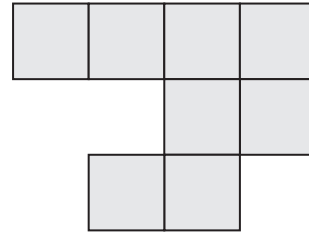
7 Here are six shapes made from centimetre squares.



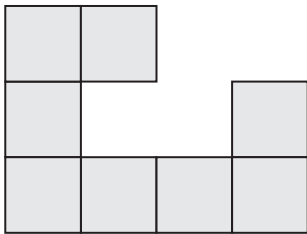
1



2



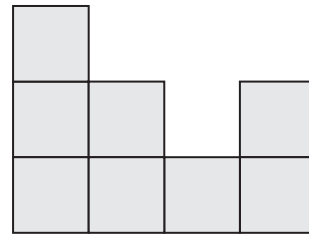
3



4



5



6

7 (a) Which **two** shapes fit together to make a rectangle?

Answer ..... and ..... (1 mark)

7 (b) Which **two** shapes fit together to make a square?

Answer ..... and ..... (1 mark)

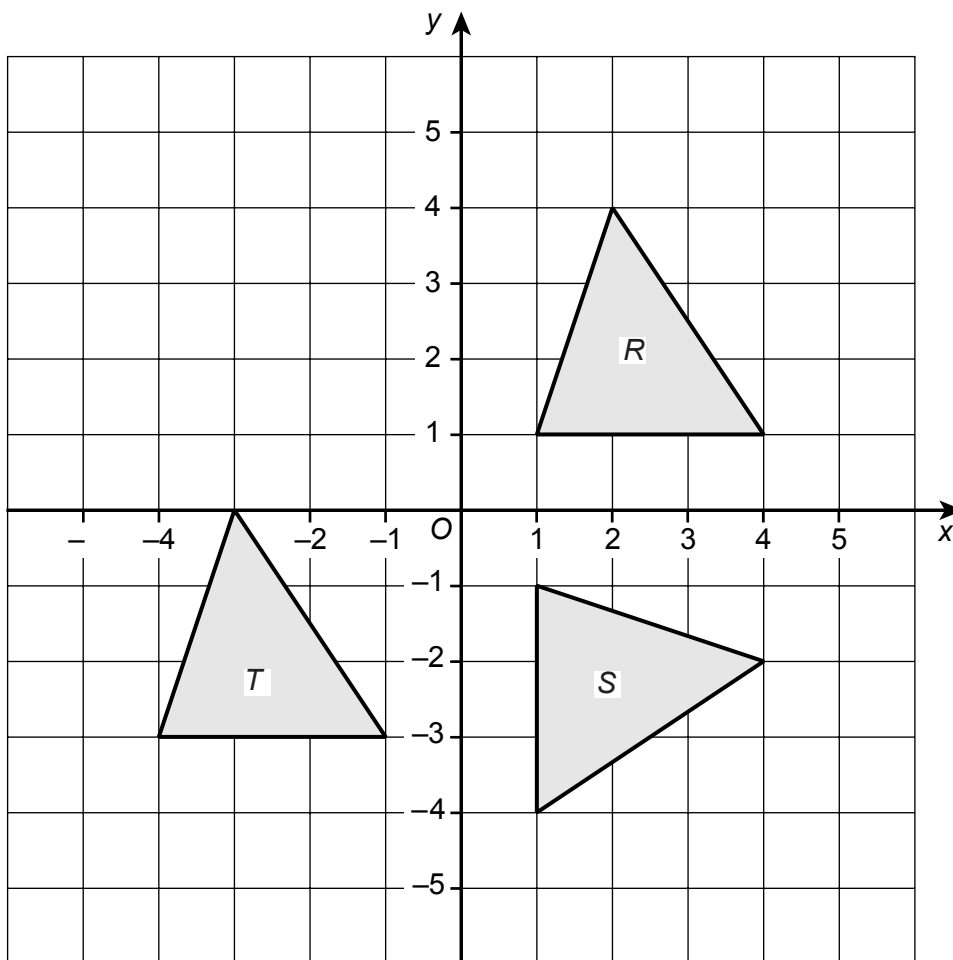
7 (c) Work out the area of shape *D*. State the units of your answer.

.....

Answer ..... (2 marks)



8 Triangles  $R$ ,  $S$  and  $T$  are shown on the grid.



8 (a) Describe fully the **single** transformation that maps triangle  $R$  onto triangle  $S$ .

.....

.....

.....

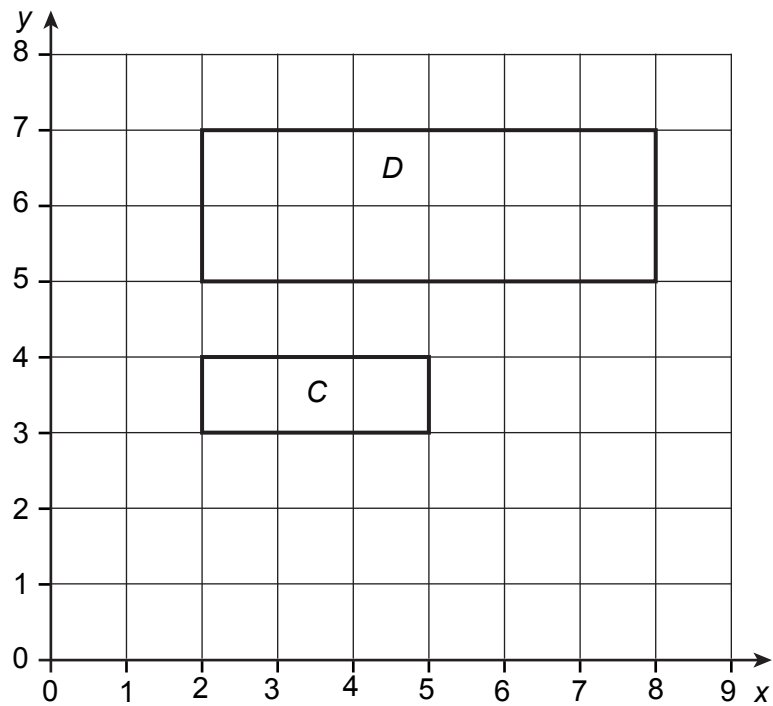
(3 marks)

8 (b) Write down the vector which describes the translation of triangle  $R$  onto triangle  $T$ .

Answer ..... (1 mark)



9 Rectangle  $D$  is an enlargement of rectangle  $C$ .



9 (a) Write down the scale factor of the enlargement.

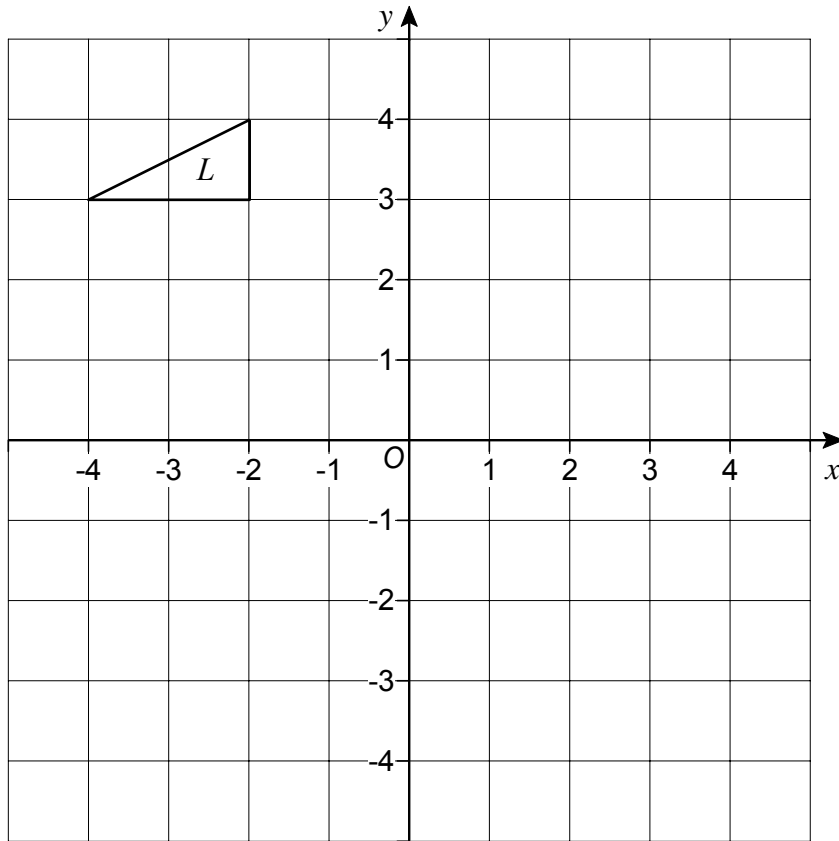
Answer ..... (1 mark)

9 (b) Write down the coordinates of the centre of the enlargement.

Answer ( ..... , ..... ) (1 mark)



- 10** The diagram shows a triangle  $L$ , with vertices at  $(-4, 3)$ ,  $(-2, 3)$  and  $(-2, 4)$ .



- 10 (a)** Draw a image of triangle  $L$  when it is reflected in the line  $y = 1$   
Label your image  $M$ .

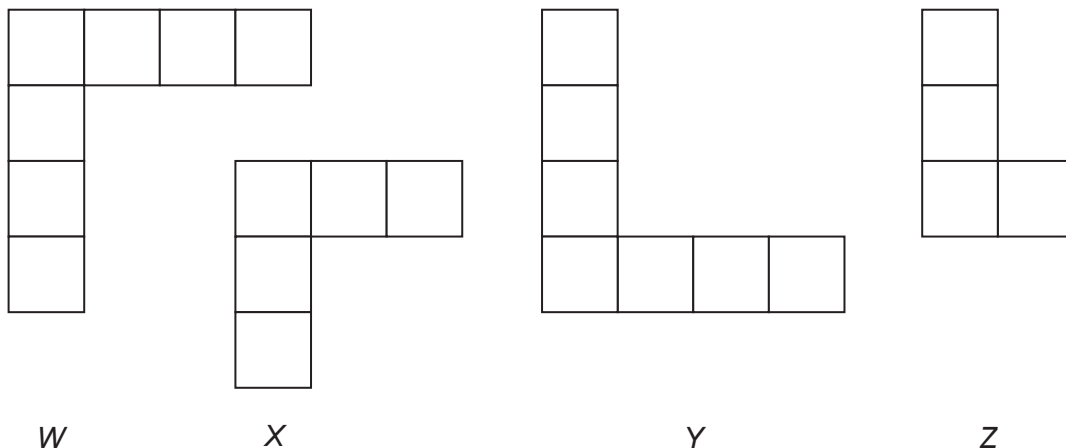
(2 marks)

- 10 (b)** Draw an image of triangle  $L$  when it is rotated  $90^\circ$  clockwise about the origin.  
Label your image  $N$ .

(3 marks)



11 Shapes W, X, Y and Z are made from squares of sides 1 cm.

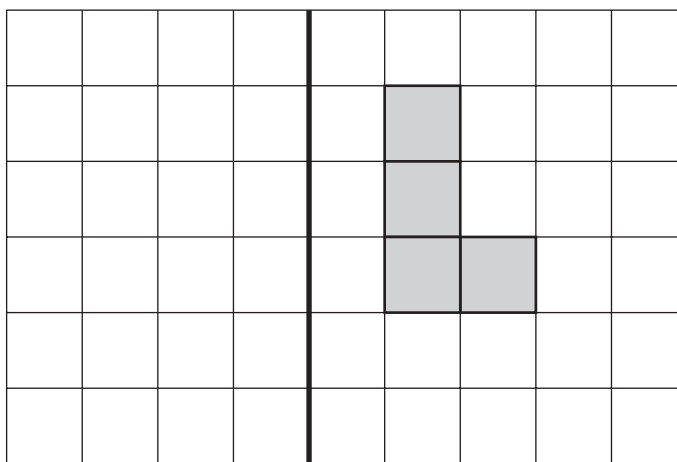


11 (a) Which **two** shapes are congruent?

Answer Shape ..... and Shape .....  
 (1 mark)

11 (b) Shape L is drawn on the grid.

Reflect shape L in the mirror line.

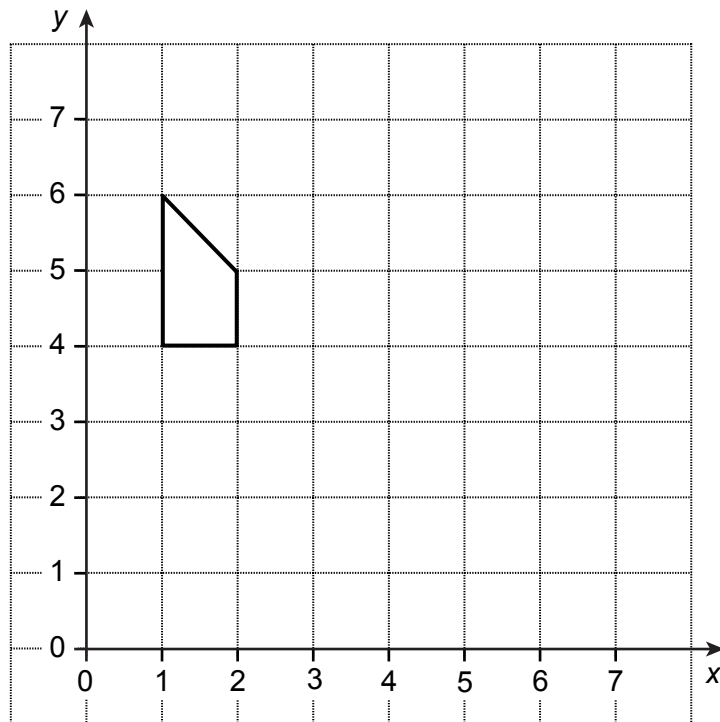


Mirror line

(2 marks)



12 Enlarge the shape in the diagram by a scale factor 3, centre (0, 6).



(2 marks)

