Surname	
Other Names	
Candidate's Signature	

GCSE 9 - 1 Questions

Mixed Transformations 2

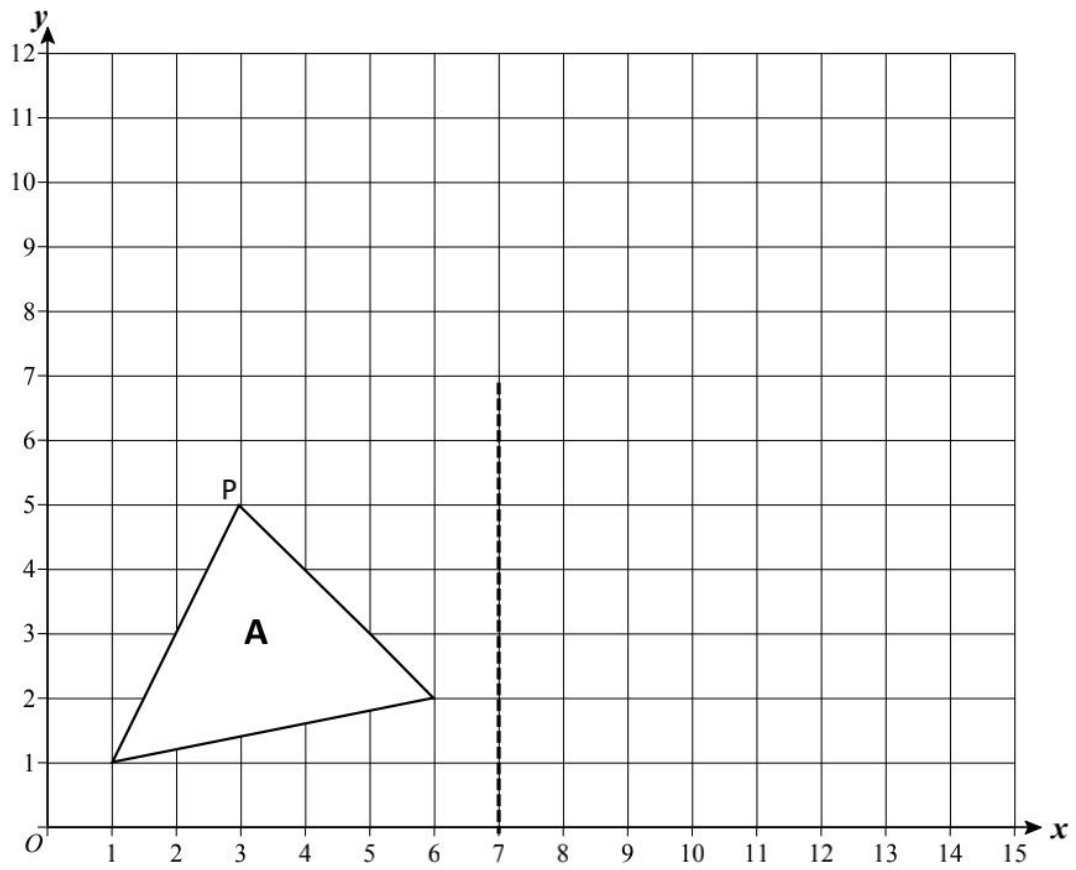
Calculator Allowed

INSTRUCTIONS TO CANDIDATES

- Write your name in the space provided.
- Write your answers in the spaces provided in this question paper.
- Answer ALL questions.
- Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.
- You should have a ruler, compass and protractor where required.

Total Marks :

1)



Draw the following transformations:

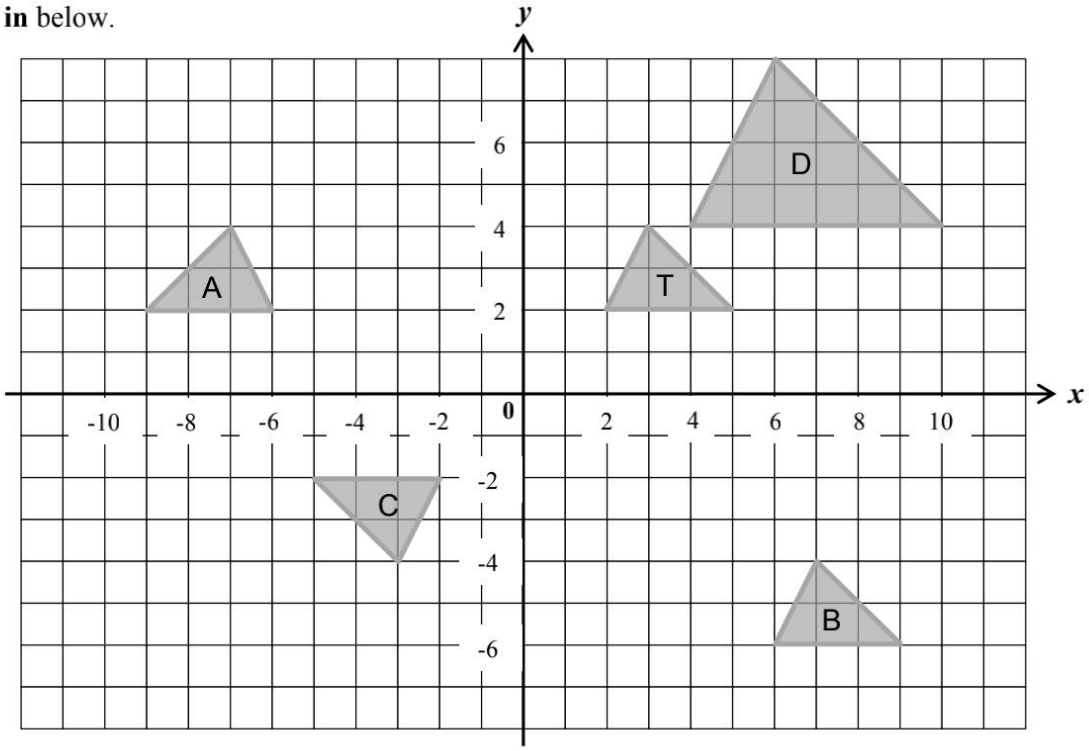
(a) Reflect shape A, in the dotted line. Label the image B.

(b) Translate shape A, 7 right and 6 up. Label the image C.

(c) Rotate shape A, 180° about its vertex P. Label the image D.

(6 marks)

2) **Fill in** below.



a) Triangle _____ is a **reflection** of triangle T in the line $x = -2$.

b) Triangle D is an **enlargement** of triangle T by scale factor _____.

c) Triangle _____ is a **rotation** of triangle T by _____° about the origin.

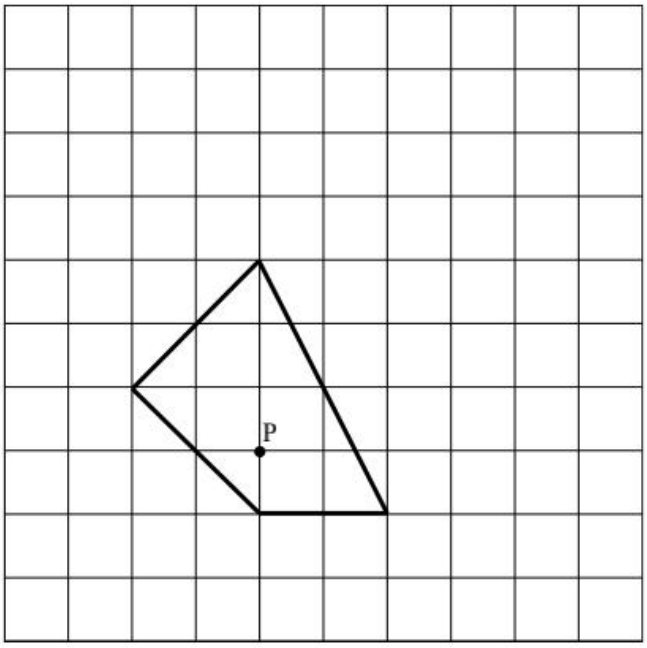
d) Triangle B is a **translation** of triangle T by _____ squares right and 8 squares _____.

e) Triangles _____ and _____ are **similar**.

f) Triangles _____ and _____ are **congruent**.

(10 marks)

3) (a) Enlarge this shape using P as the centre of enlargement and scale factor 2.

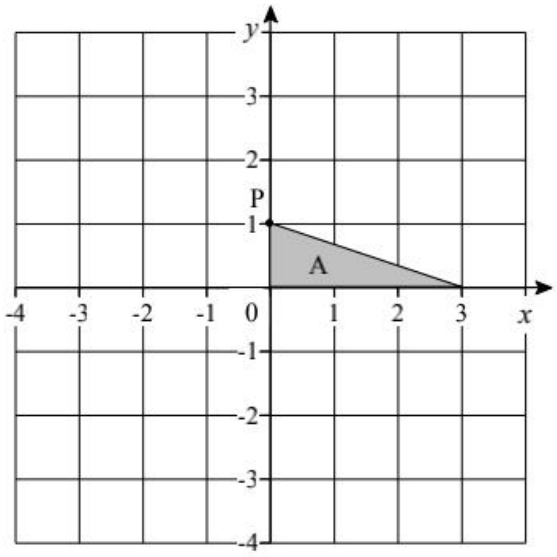


(b) Use the grid below to show the following transformations.

(i) A reflection of shape A in the line $x = 0$. Label the image B.

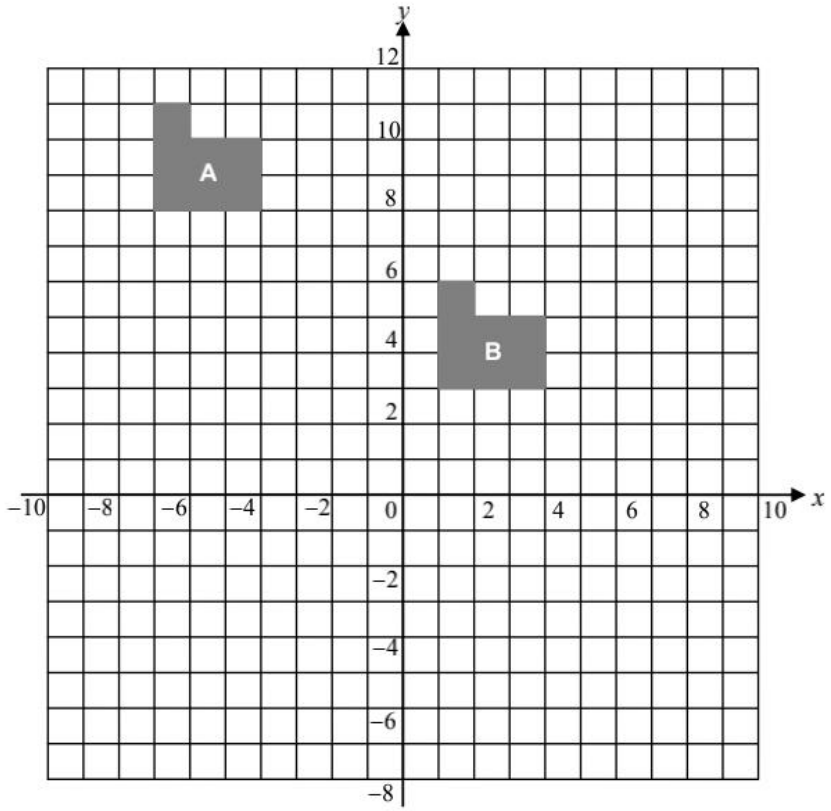
(ii) A translation of shape A by 4 left and 3 down. Label the image C.

(iii) A rotation of shape A 90° anticlockwise centre P. Label the image D.



(7 marks)

4)



(a) Tick the correct answer:

The transformation that maps shape A to shape B is

an enlargement ☐ a translation ☐ a rotation ☐

(b) **Reflect** Shape B in the y-axis. Label your shape C.

(c) **Rotate** Shape B by 180° about the origin. Label your shape D.

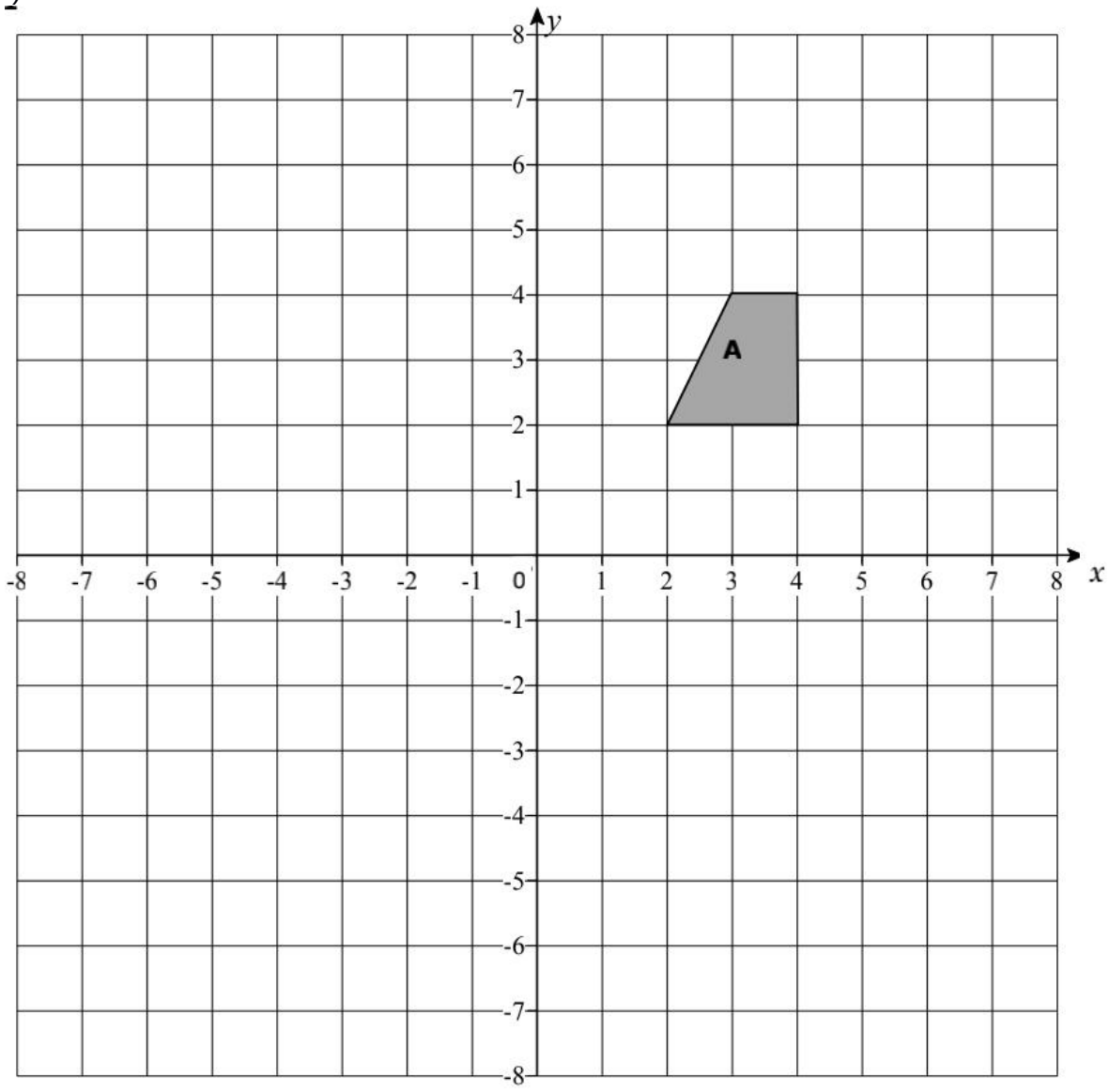
(d) **Enlarge** Shape B by scale factor 2 using the origin as the centre of enlargement. Label your shape E.

(e) Complete:

The **area** of Shape E is _____ times that of Shape B.

[8 marks]

5)



(a) Shape B is the reflection of shape A in the y-axis. Draw and label shape B.

(b) Shape C is the reflection of shape A in the x-axis. Draw and label shape C.

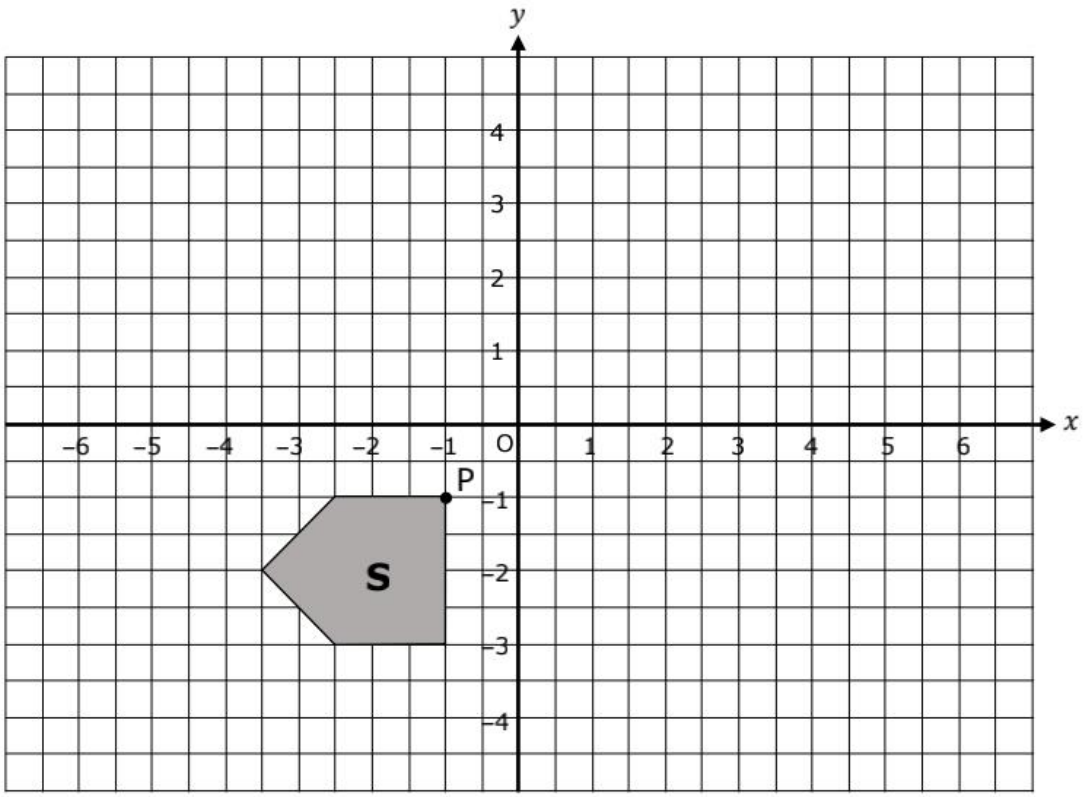
(c) Shape D is a translation of shape A by 9 left and 8 down. Draw and label shape D.

(d) Shape E is a 180° rotation of shape A about the origin. Draw and label shape E.

(e) F is an enlargement of shape A about the origin by scale factor 2.
Draw and label shape F.

(10 marks)

6)



Draw the following transformations on the grid above.

(a) Reflect shape **S** in the x–axis. Label the image **A**.

(b) Translate shape **S** by 6 right and 4 up. Label the image **B**.

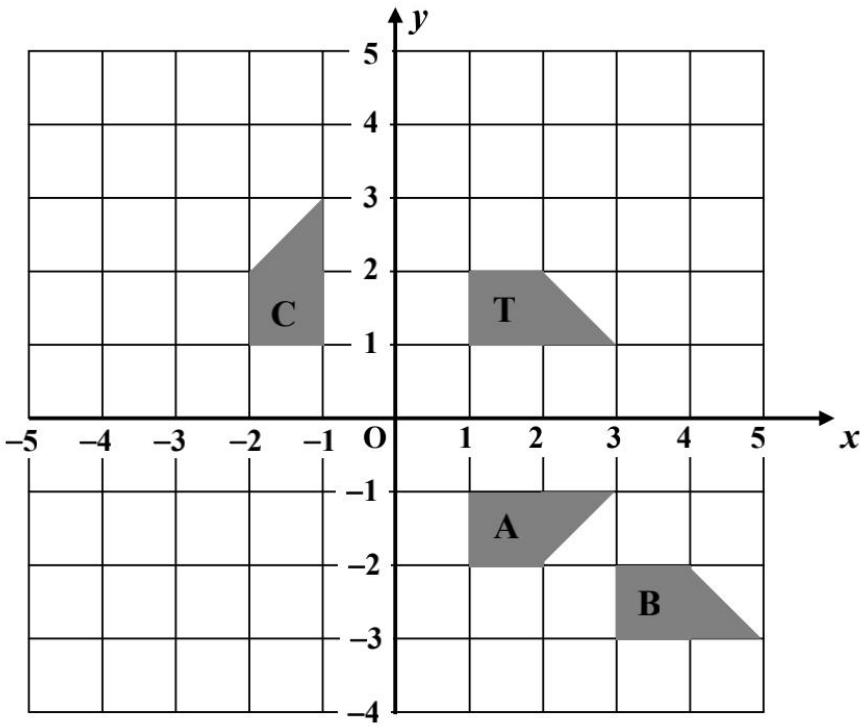
(c) Rotate shape **S** 90° anticlockwise, centre the origin. Label the image **C**.

(d) Enlarge shape **S** using centre P and scale factor 2. Label the image **D**.

(e) Fill in: Shape _____ and shape _____ are congruent.

(9 marks)

7)



(a) Describe the transformation that maps shape T to shape A.

_____

(b) Describe the transformation that maps shape T to shape B.

_____

(c) Describe the transformation that maps shape T to shape C.

_____

(d) Shape T is enlarged by a scale factor of 2, through the point (5, 5). Draw the image of shape T.

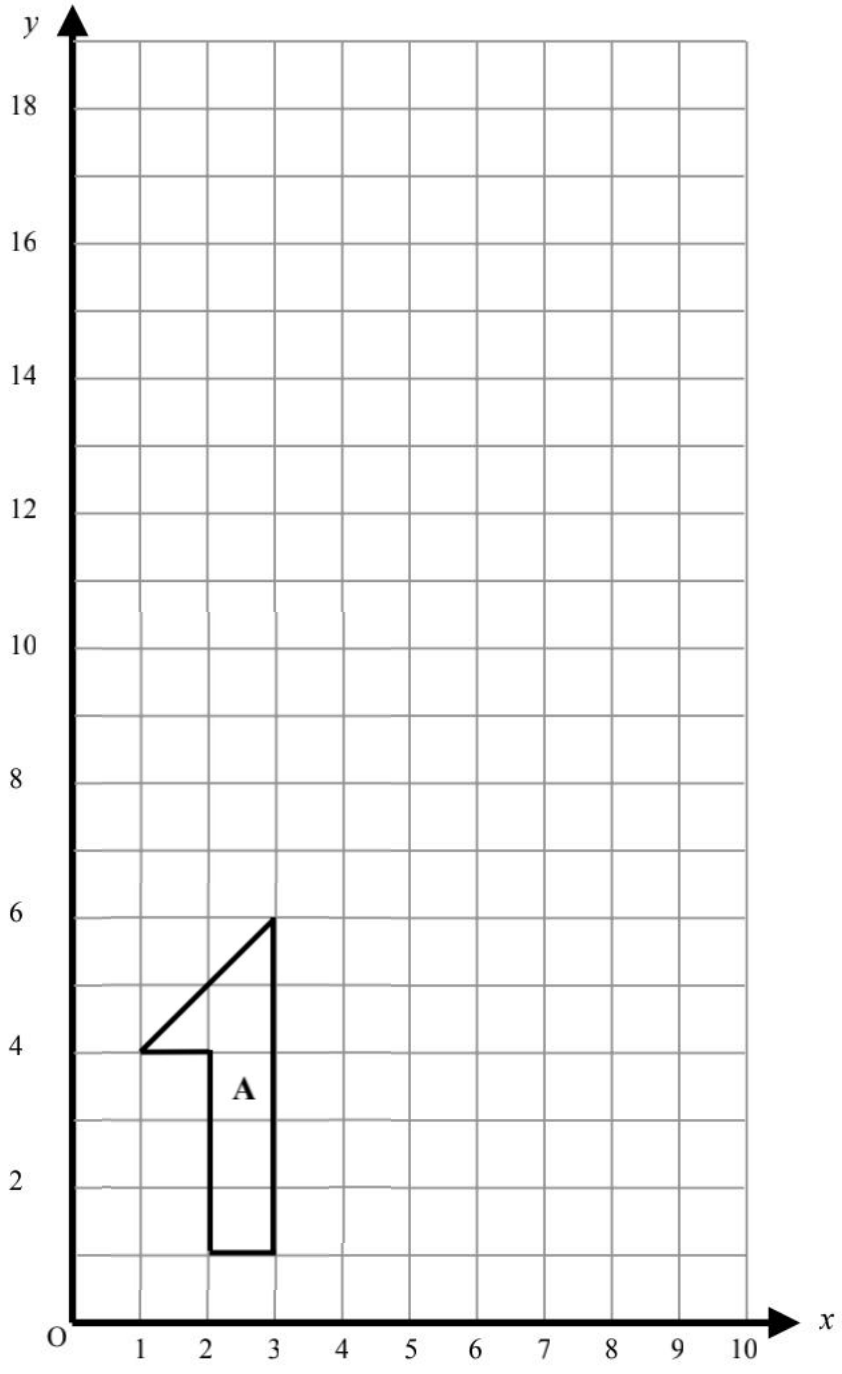
(8 marks)

8) Use the given grid to:

a) **Enlarge** figure A by a scale factor of 3 about the point (0,0) to obtain figure B.

b) **Translate** figure A by the vector $\begin{pmatrix} -1 \\ 5 \end{pmatrix}$ to obtain figure C.

c) **Reflect** figure A in the line $x = 3$ to obtain figure D.

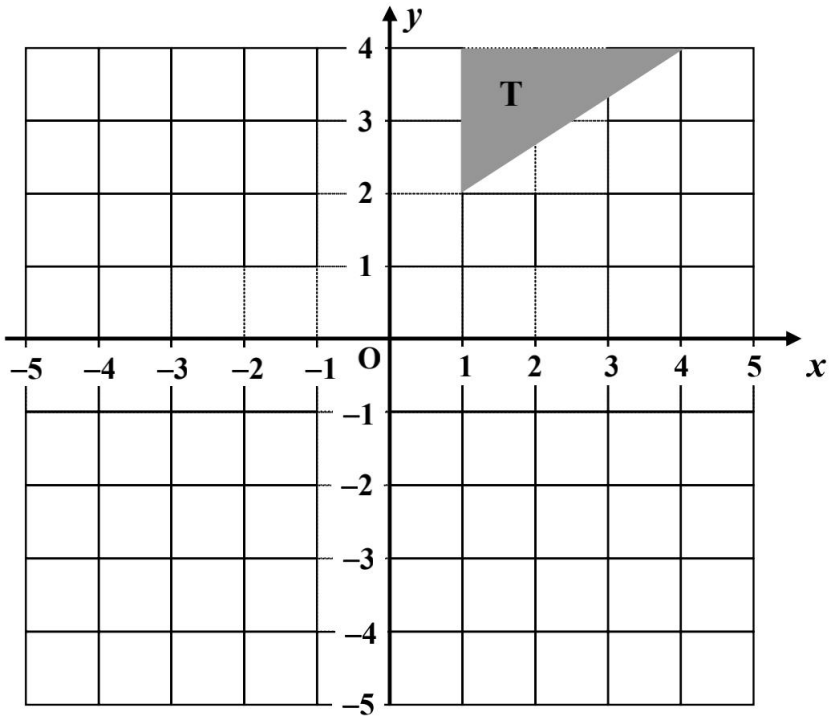


(5 marks)

9) (a) T1 is the image of T when it is reflected in the ***y*-axis**. Draw and label T1

(b) T2 is the image of T when it is reflected in the line $y = x$. Draw and label T2.

(c) T3 is the image of T when it is **rotated** through **180°** about **(0, 0)**. Draw and label T3.



(d) Describe the single transformation that will map T1 to T3.

_____

(8 marks)

10) On the given grid:

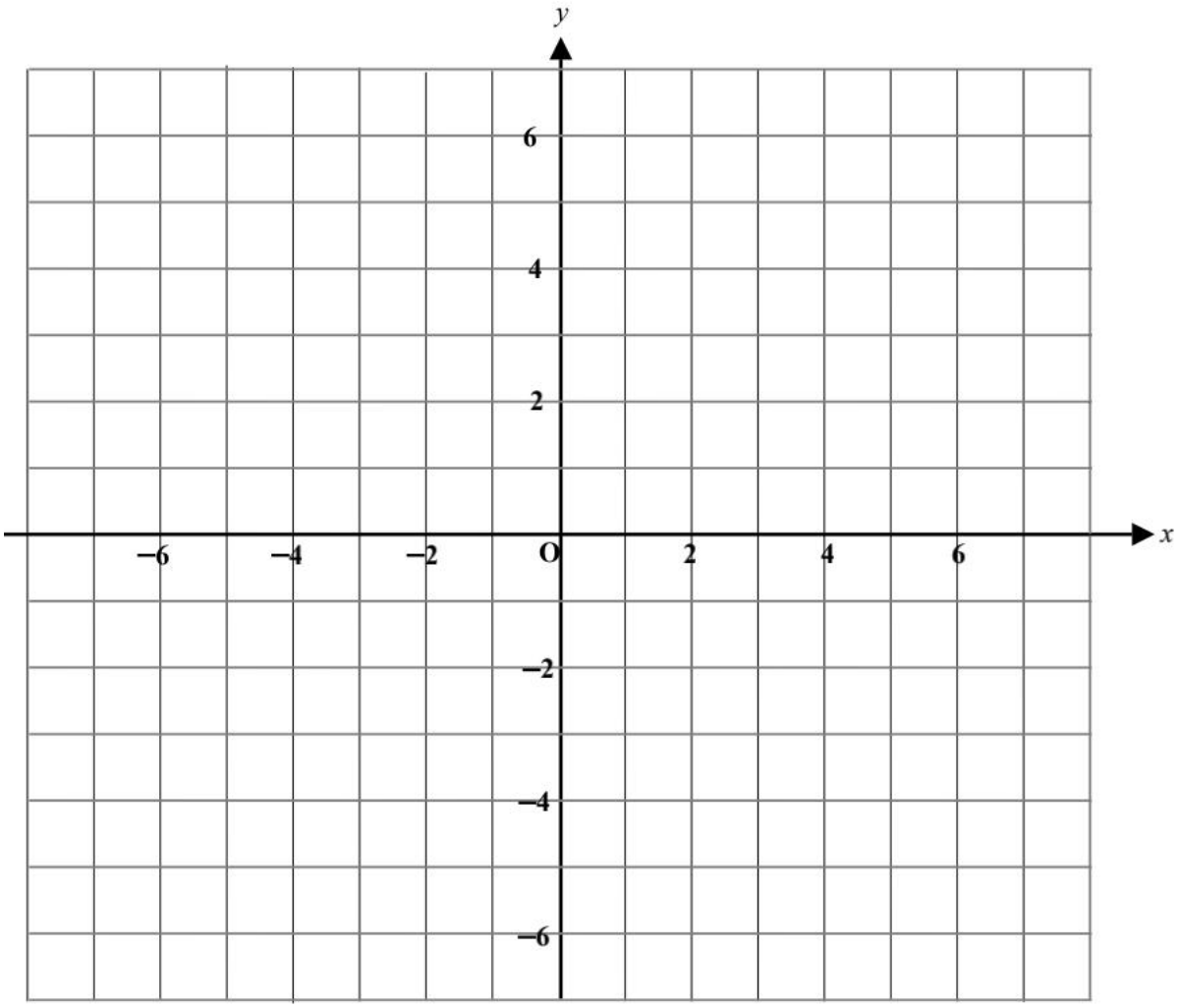
a) **Plot** and **join** the points (2,2) (4,2) (5,6) and (1,6) to form a **trapezium**. Label this figure A.

b) Draw the line $y = 1$.

c) **Reflect** figure A in the line $y = 1$ and label it B.

d) **Translate** figure B by the vector $\begin{pmatrix} -6 \\ 3 \end{pmatrix}$ and label the image C.

e) One of the vertices of **figure A** lies on the graph of $y = x$. Write down the coordinates of this point.



Coordinates of the point are (....., ...)

(10 marks)

11)

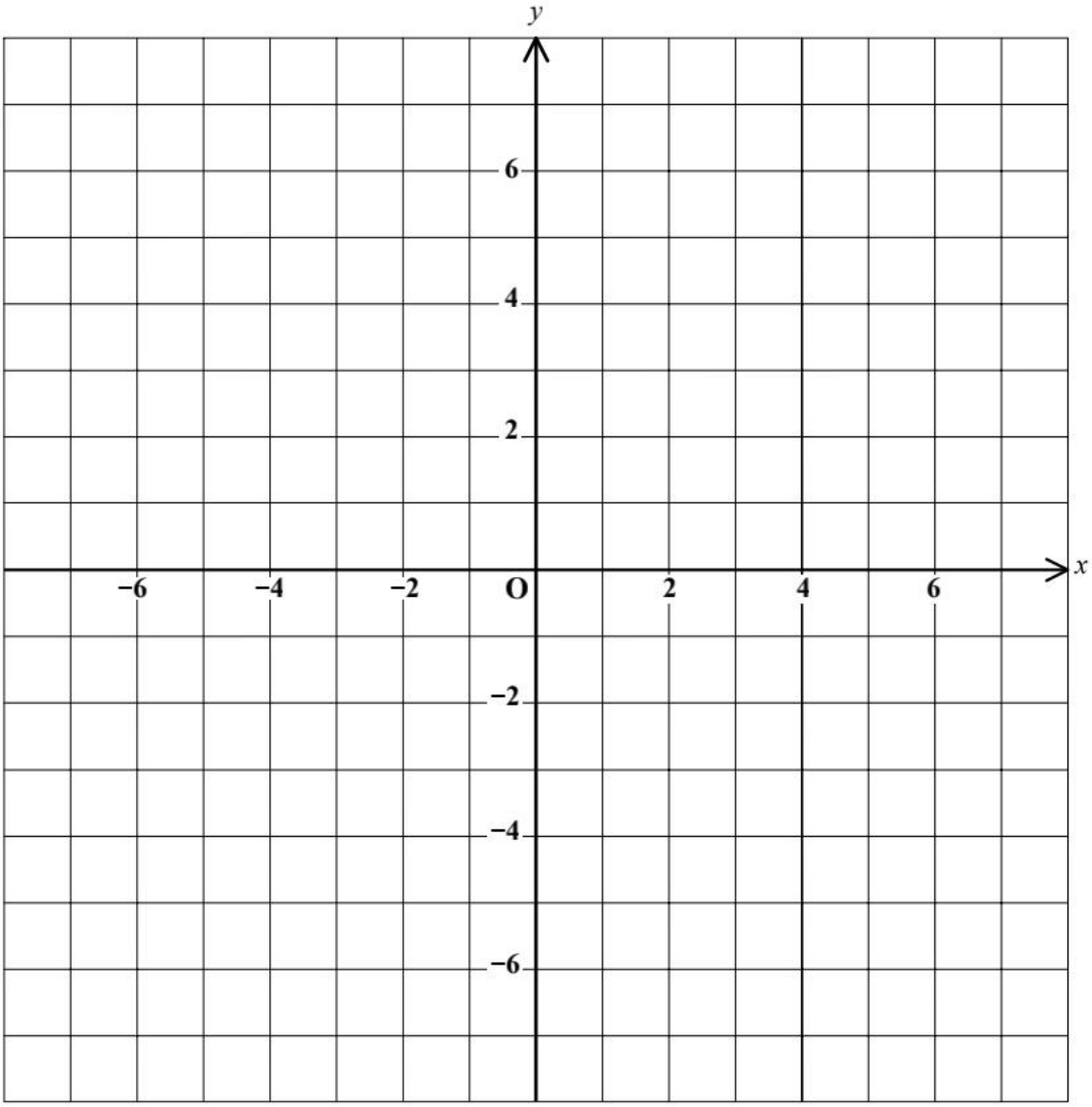
a) On the grid provided, **plot** and **join** the points A (3 , 2), B(6 , 2) and C(3 , 7) to obtain triangle ABC.

b) **Reflect** triangle ABC in the *y*-axis. Label the corresponding vertices of the image A′B′C′.

c) **Rotate** triangle ABC through 90° clockwise about (0 , 0). Label this image R.

d) Plot and draw the points (−2 , −4), (−5 , −4) and (−2 , 1) and label this figure T. Write down the column vector by which triangle A′B′C′ is **translated** to obtain figure T.

Column Vector.....



(11 marks)

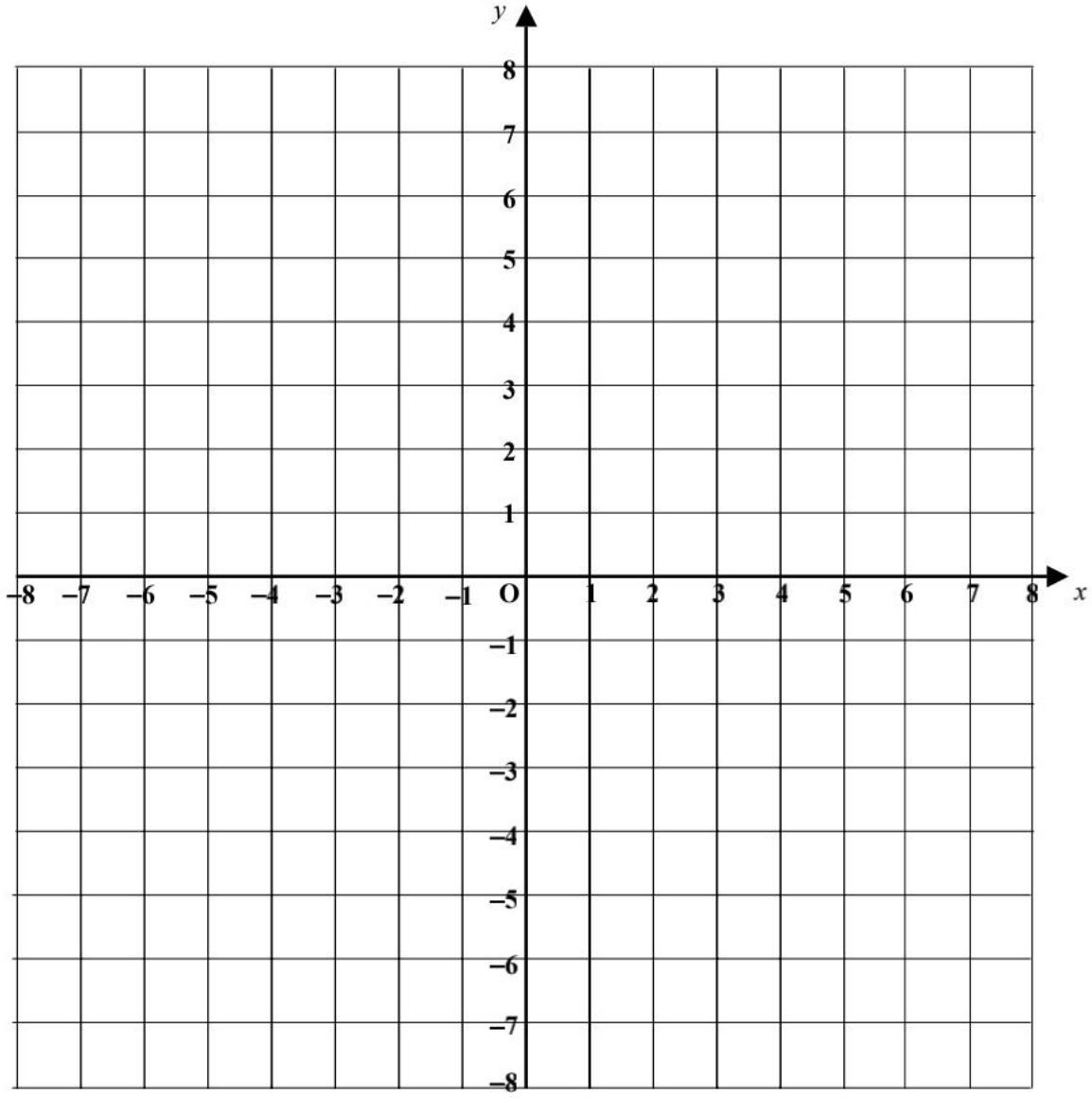
12)

a) On the grid provided, **plot and join** the points A (3,2), B(6,2) and C(3,6) to obtain triangle ABC.

b) **Reflect** triangle ABC in the *y*-axis to obtain figure P. Draw and label figure P

c) **Reflect** figure P in the *x*-axis to obtain figure Q. Draw and label figure Q.

d) **Translate** figure Q by the vector $\begin{pmatrix} 5 \\ 1 \end{pmatrix}$ to obtain figure T. Draw and label figure T.



(9 marks)

13) On the given grid:

a) **Plot** and **join** the points A (1,2) B (3,2) C (3,5) and D (1,5).

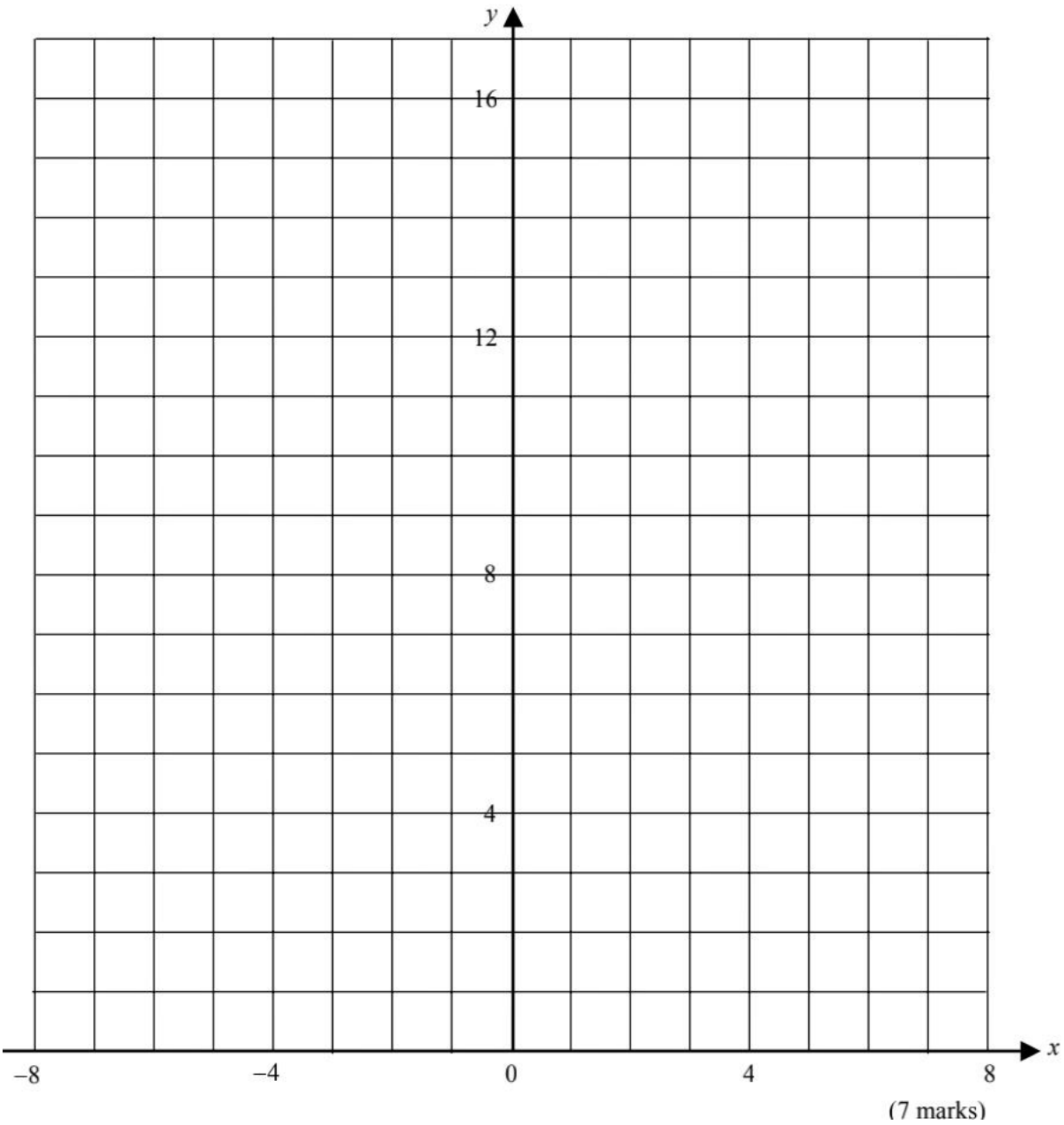
b) **Reflect** ABCD in the y-axis and label the image A′B′C′D′.

c) **Enlarge** A′B′C′D′ by a scale factor of 2 about the point (0,0) and label the image A″B″C″D″.

d) Write down, **in the simplest form**, the ratio of the lengths of the diagonals

BD : B″D″ = ☐ : ☐.

e) **Translate** A″B″C″D″ by the vector $\begin{pmatrix} 8 \\ 5 \end{pmatrix}$ and label the image T.



(7 marks)

14)

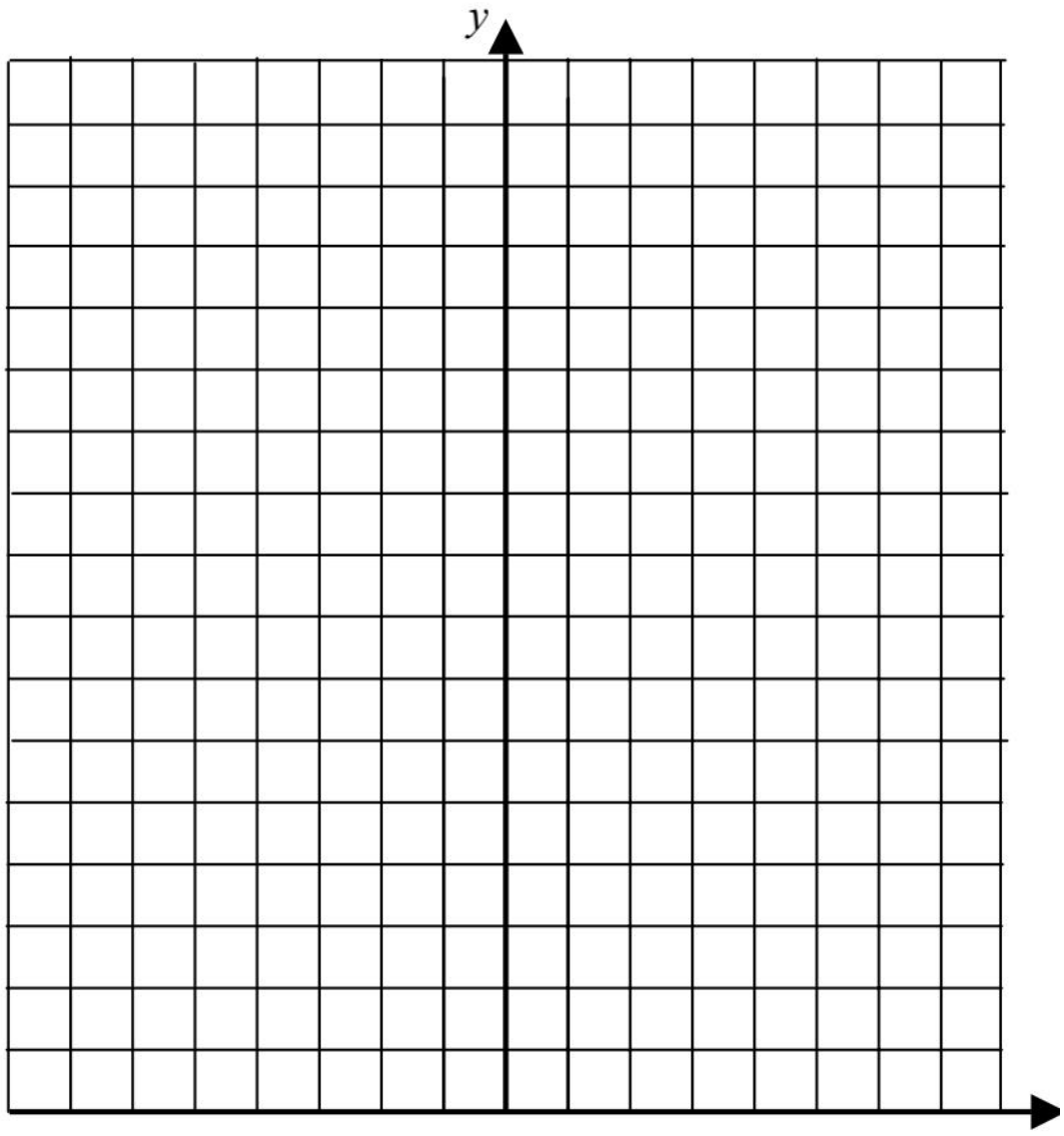
On the squared grid given below choose a suitable scale for the x-axis from -6 to 6 and for the y-axis from 0 to 16.

a) Plot the points A $(-6, 0)$, B $(-4, 0)$ and C $(-4, 4)$. Join A, B and C.

b) Translate triangle ABC by the vector $\begin{pmatrix} 3 \\ 4 \end{pmatrix}$ and label it T.

c) Reflect triangle T in the y-axis and label it M.

d) Enlarge triangle M by a scale factor of 2 about $(0, 0)$. Label it E.



(8 marks)