

Non-Calculator Questions

Transformations

Translations / Reflections / Rotations / Enlargements

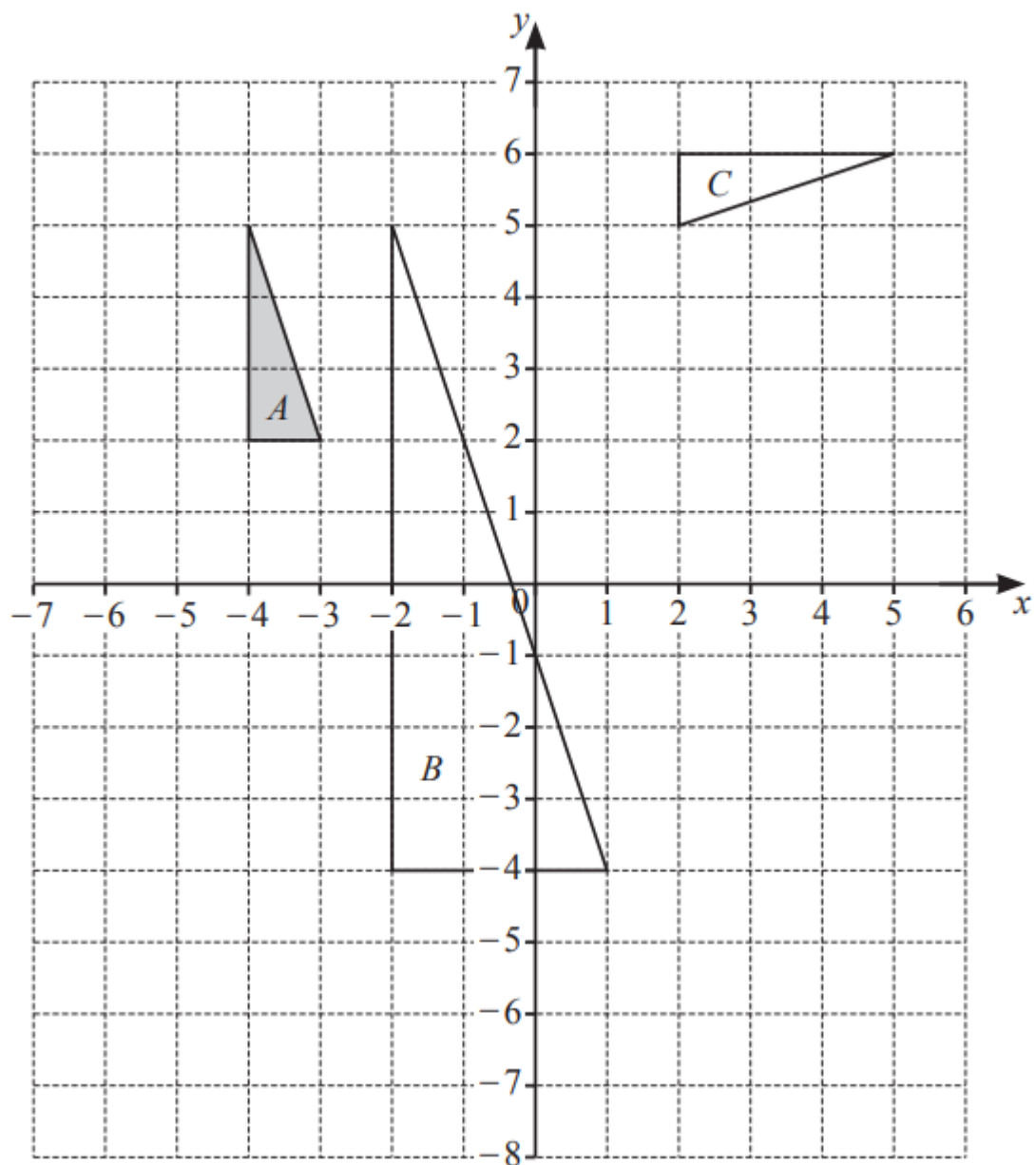
Easy (7 questions)	/23
Medium (13 questions)	/51
Hard (13 questions)	/54
Very Hard (10 questions)	/30
Total Marks	/158

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Easy Questions

1 (a)



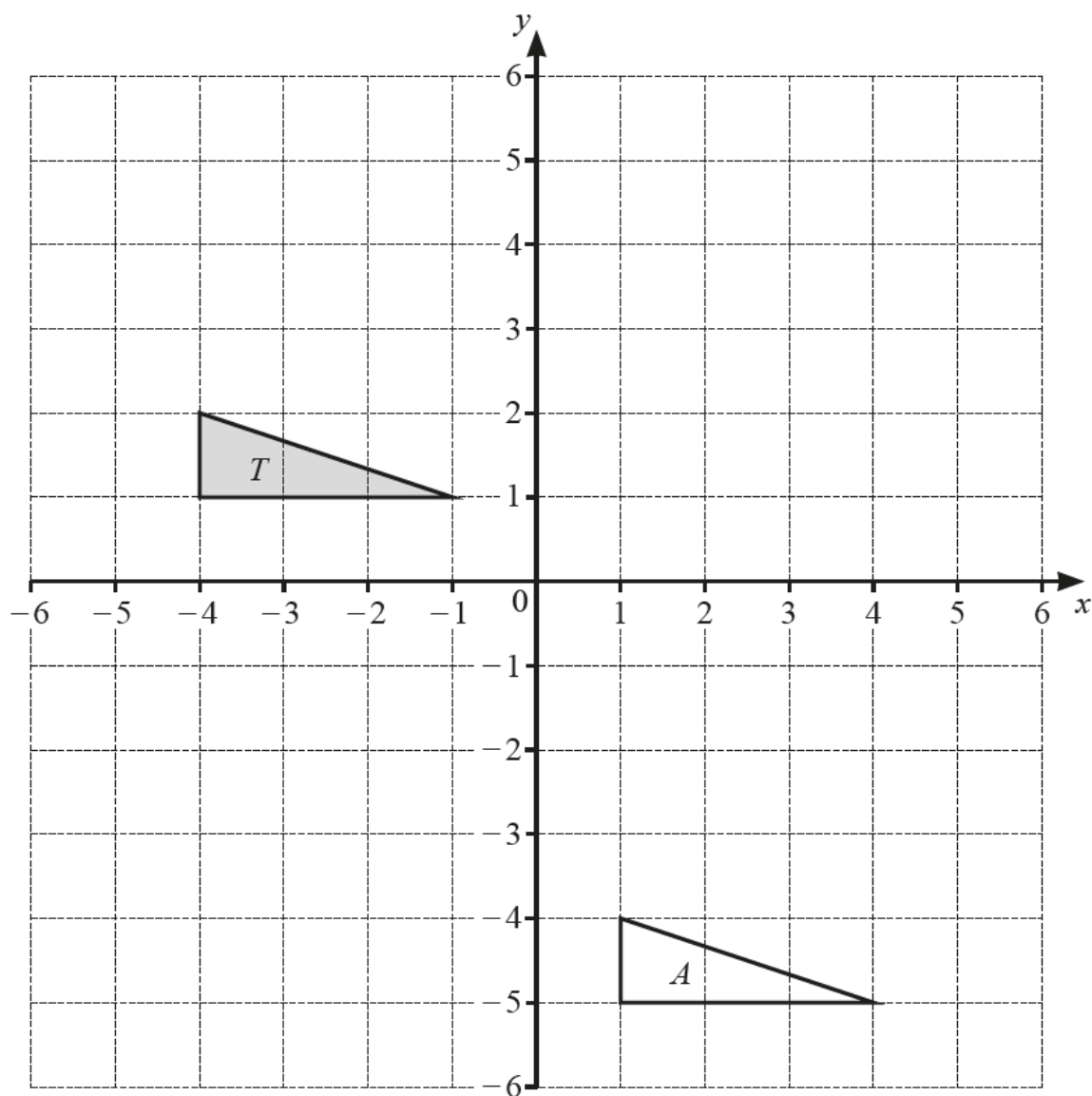
Draw the image of shape A after a translation by the vector $\begin{pmatrix} 8 \\ -6 \end{pmatrix}$.

(2 marks)

(b) Draw the image of shape A after a reflection in the line $y = -1$.

(2 marks)

2 (a)



Draw the image of triangle T after a reflection in the line $y = -1$.

(2 marks)

(b) Draw the image of triangle T after a rotation through 90° clockwise about $(0, 0)$.

(2 marks)

(c) Describe fully the single transformation that maps triangle T onto triangle A .

(2 marks)

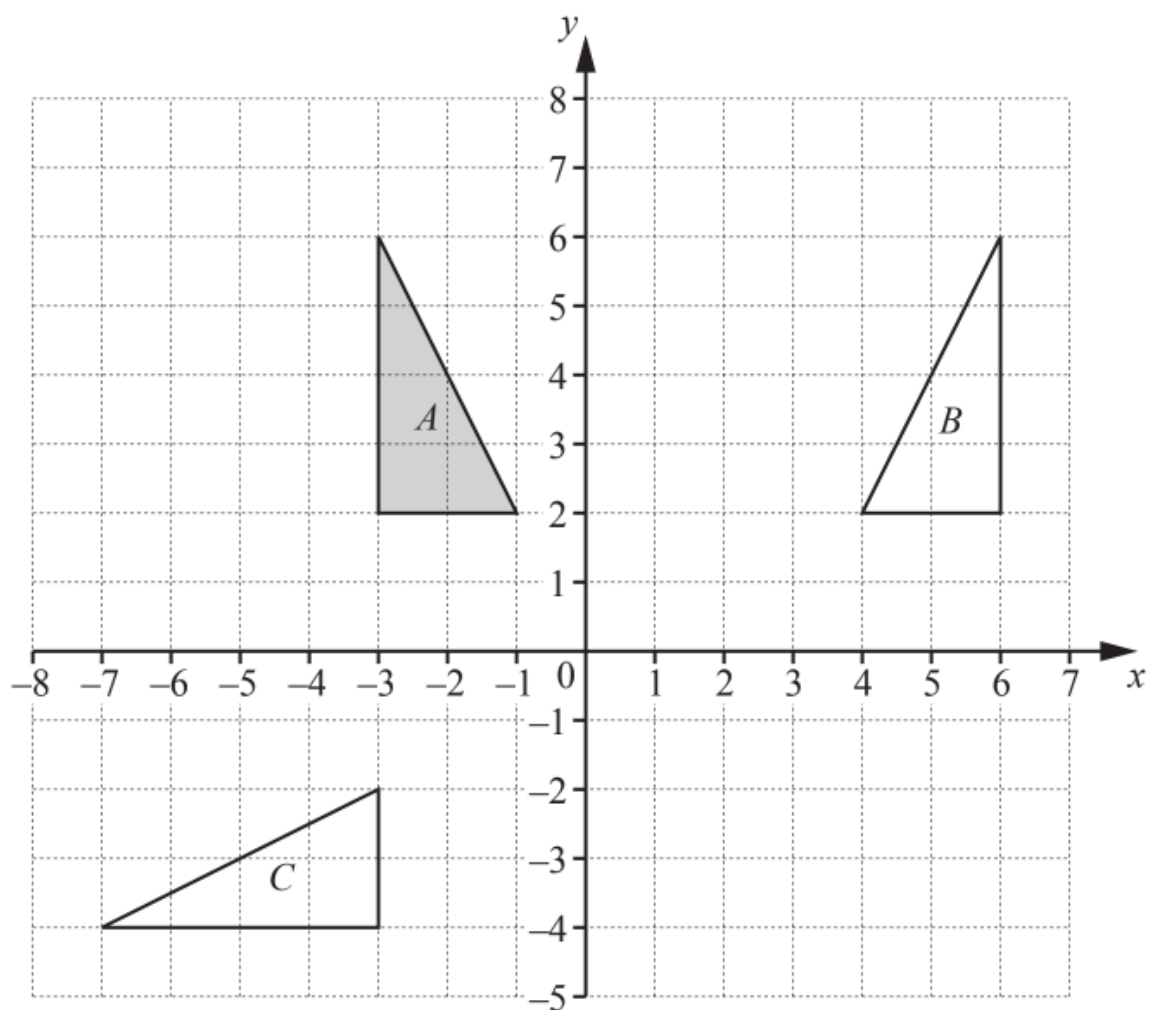
- 3** A line joins $A(1, 3)$ to $B(5, 8)$.
The line AB is transformed to the line PQ .

Find the co-ordinates of P and the co-ordinates of Q after AB is translated by the vector $\begin{pmatrix} 5 \\ -2 \end{pmatrix}$.

$P(\text{.....}, \text{.....})$

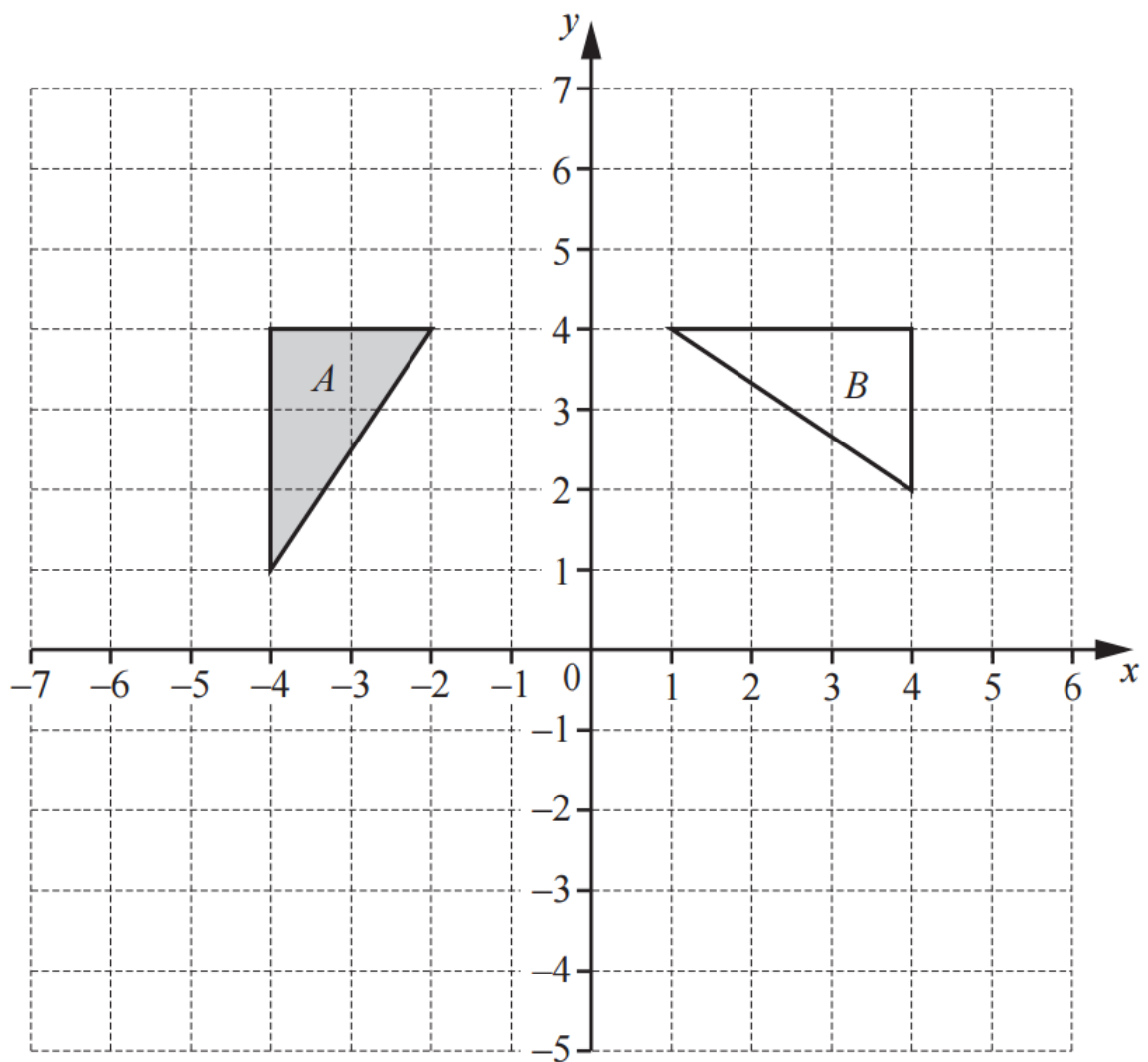
$Q(\text{.....}, \text{.....})$

(2 marks)



On the grid, draw the image of triangle A after a translation by the vector $\begin{pmatrix} -3 \\ 1 \end{pmatrix}$,
(2 marks)

5



On the grid, draw the image of

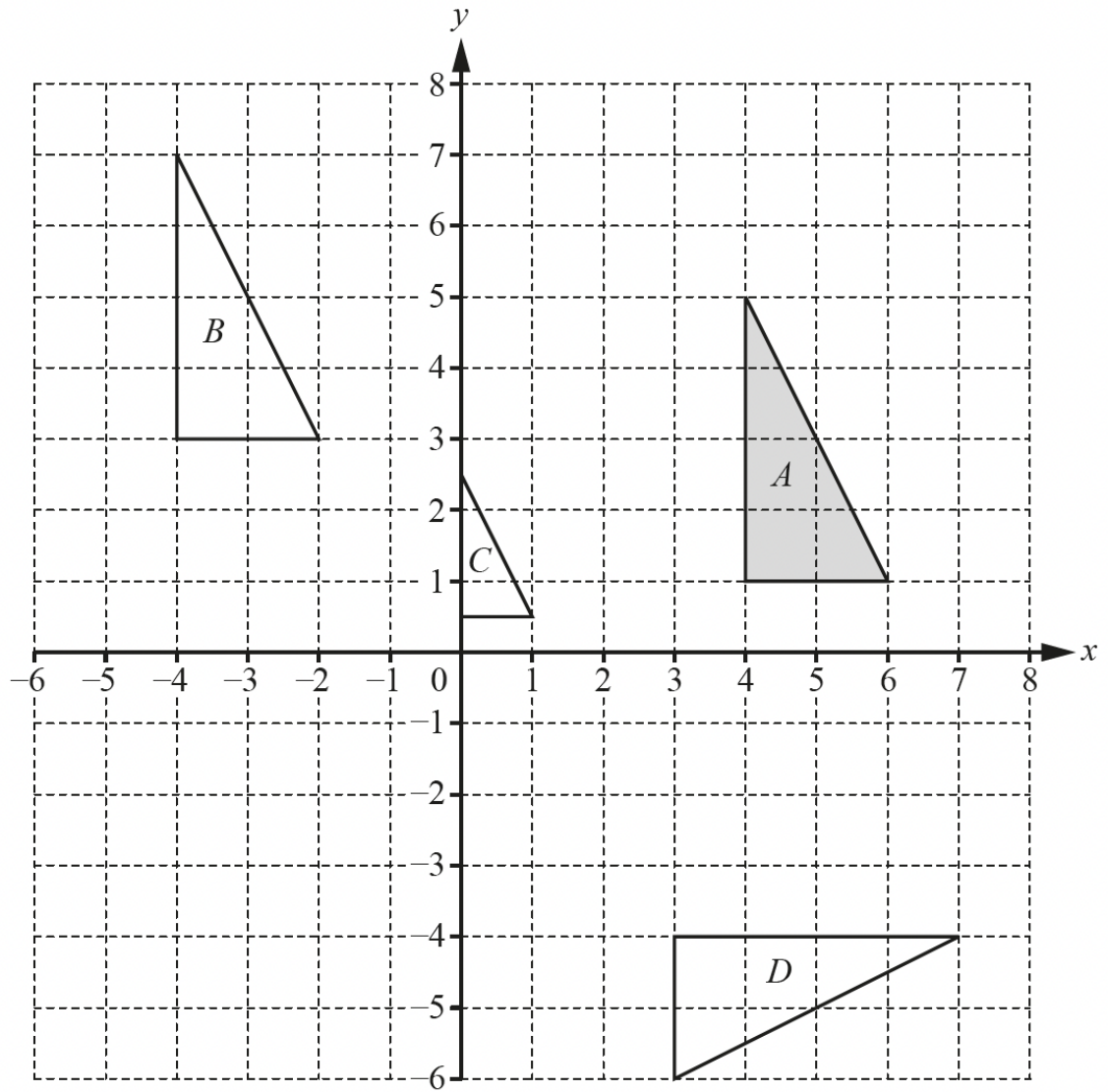
i) triangle A after a reflection in the x -axis,

[1]

ii) triangle A after a translation by the vector $\begin{pmatrix} 7 \\ -5 \end{pmatrix}$,

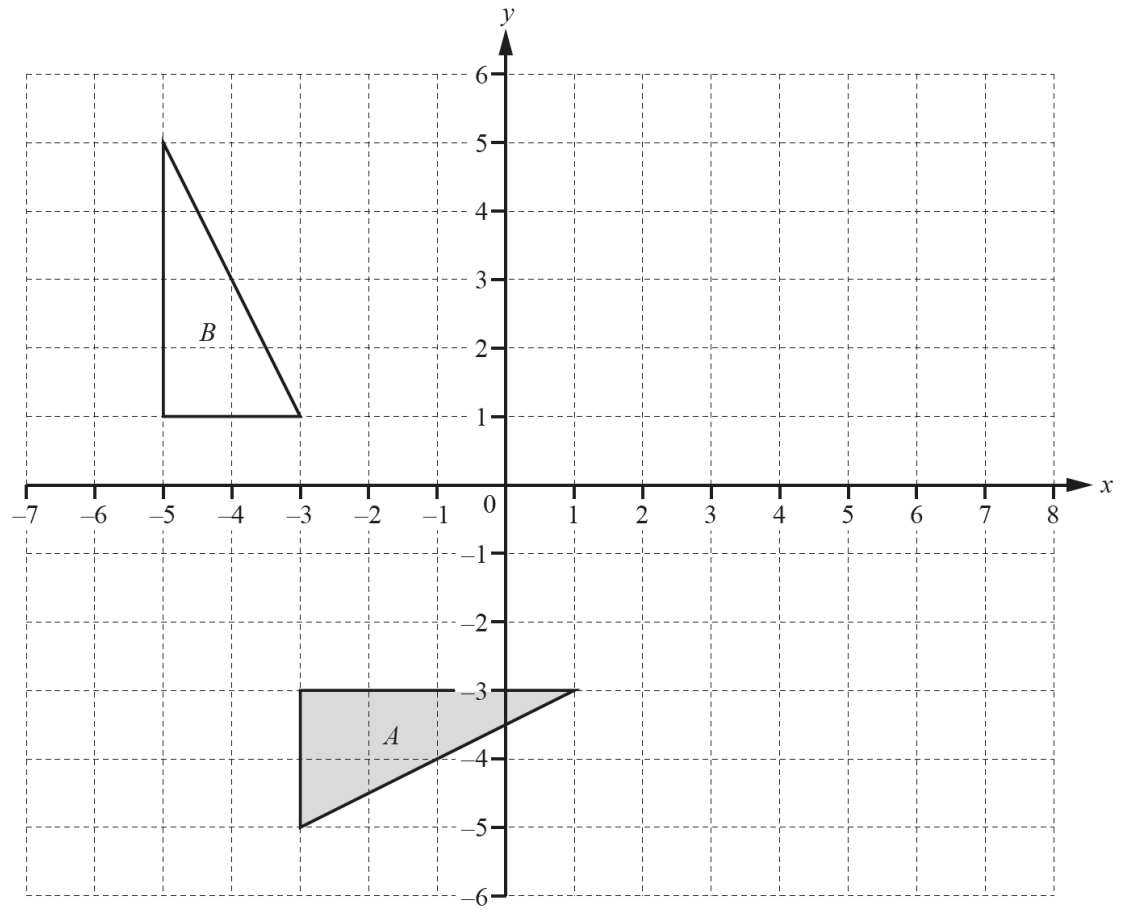
[2]

(3 marks)



Describe fully the single transformation that maps triangle *A* onto triangle *B*.

(2 marks)



i) Draw the image of triangle A after a reflection in the line $x = 2$.

[2]

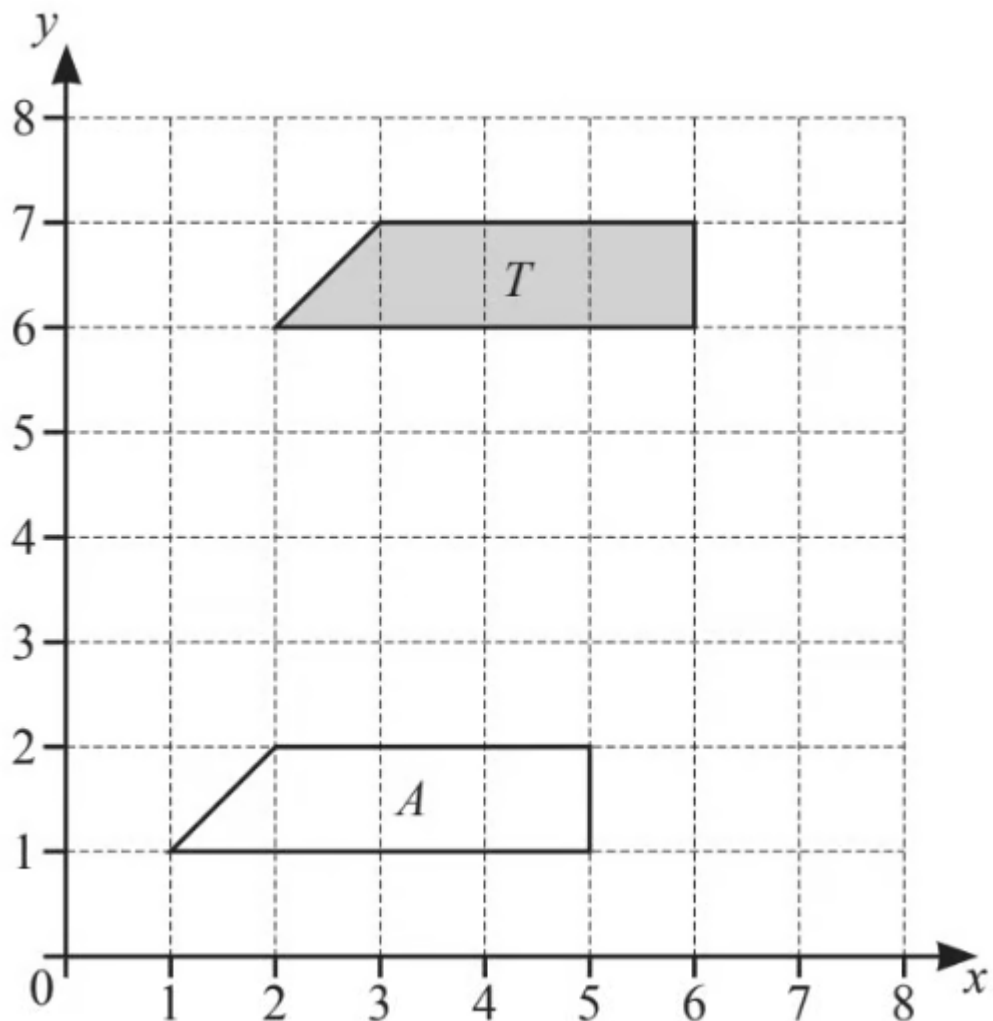
ii) Draw the image of triangle A after a translation by the vector $\begin{pmatrix} -2 \\ 4 \end{pmatrix}$.

[2]

(4 marks)

Medium Questions

1 (a)



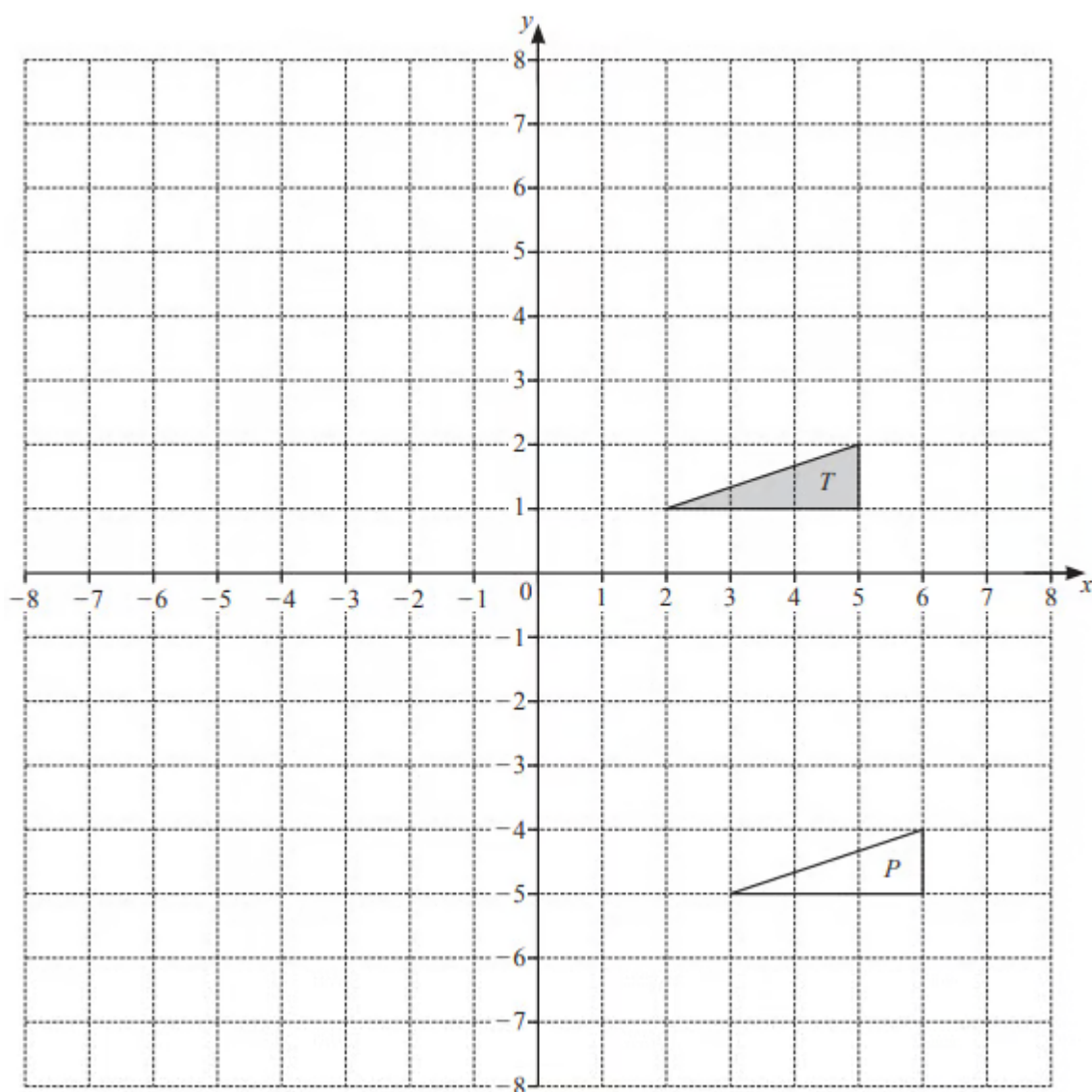
Describe fully the single transformation that maps shape T onto shape A .

(2 marks)

(b) On the grid, reflect shape T in the line $y = x$.

(2 marks)

2 (a)



Describe fully the **single** transformation that maps triangle T onto triangle P .

(2 marks)

(b) i) Reflect triangle T in the line $x = 1$.

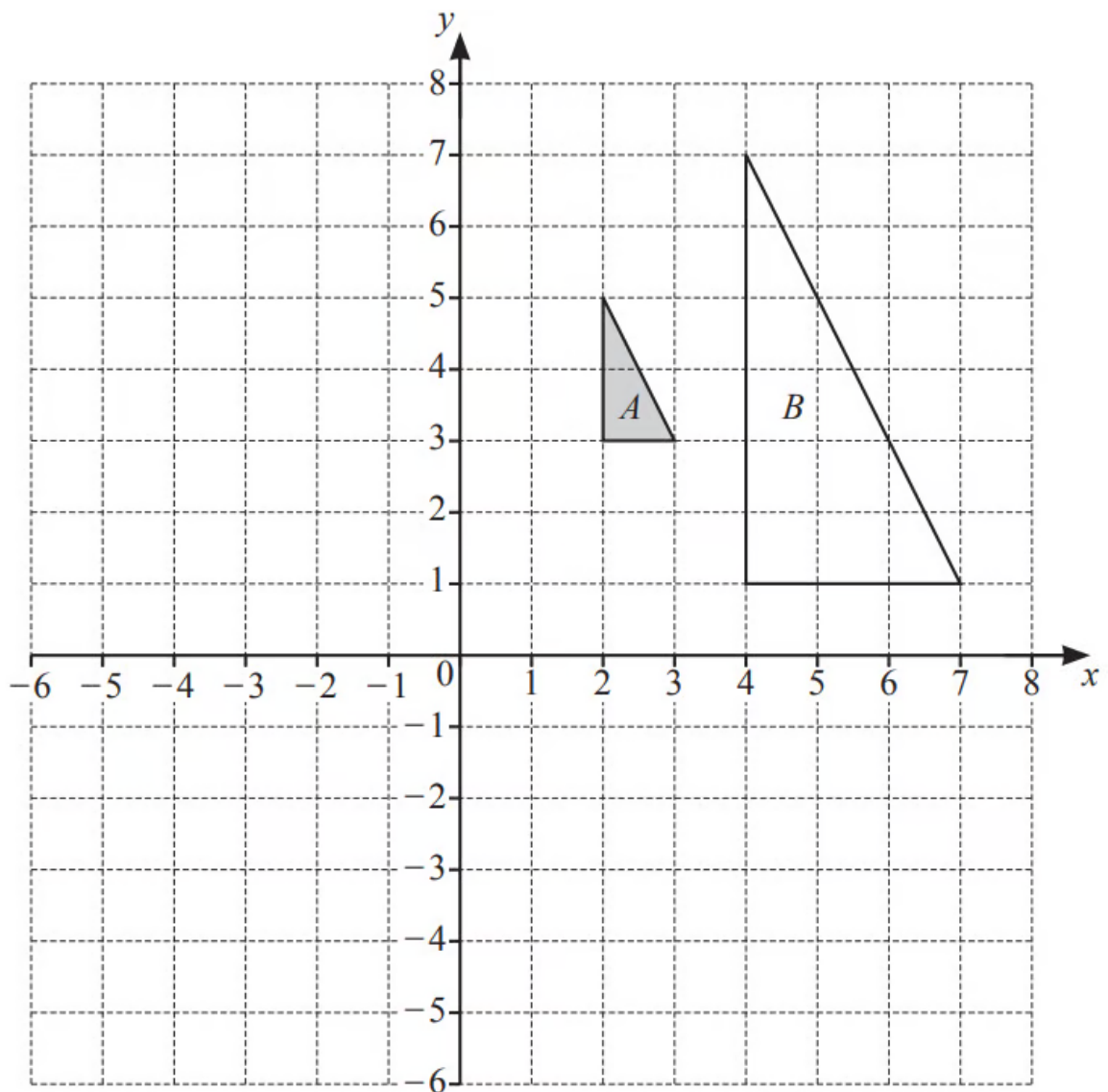
[2]

ii) Rotate triangle T through 90° anticlockwise about $(6, 0)$.

[2]

(4 marks)

3



On the grid, draw the image of

i) triangle A after a rotation of 90° anticlockwise about (0, 0),

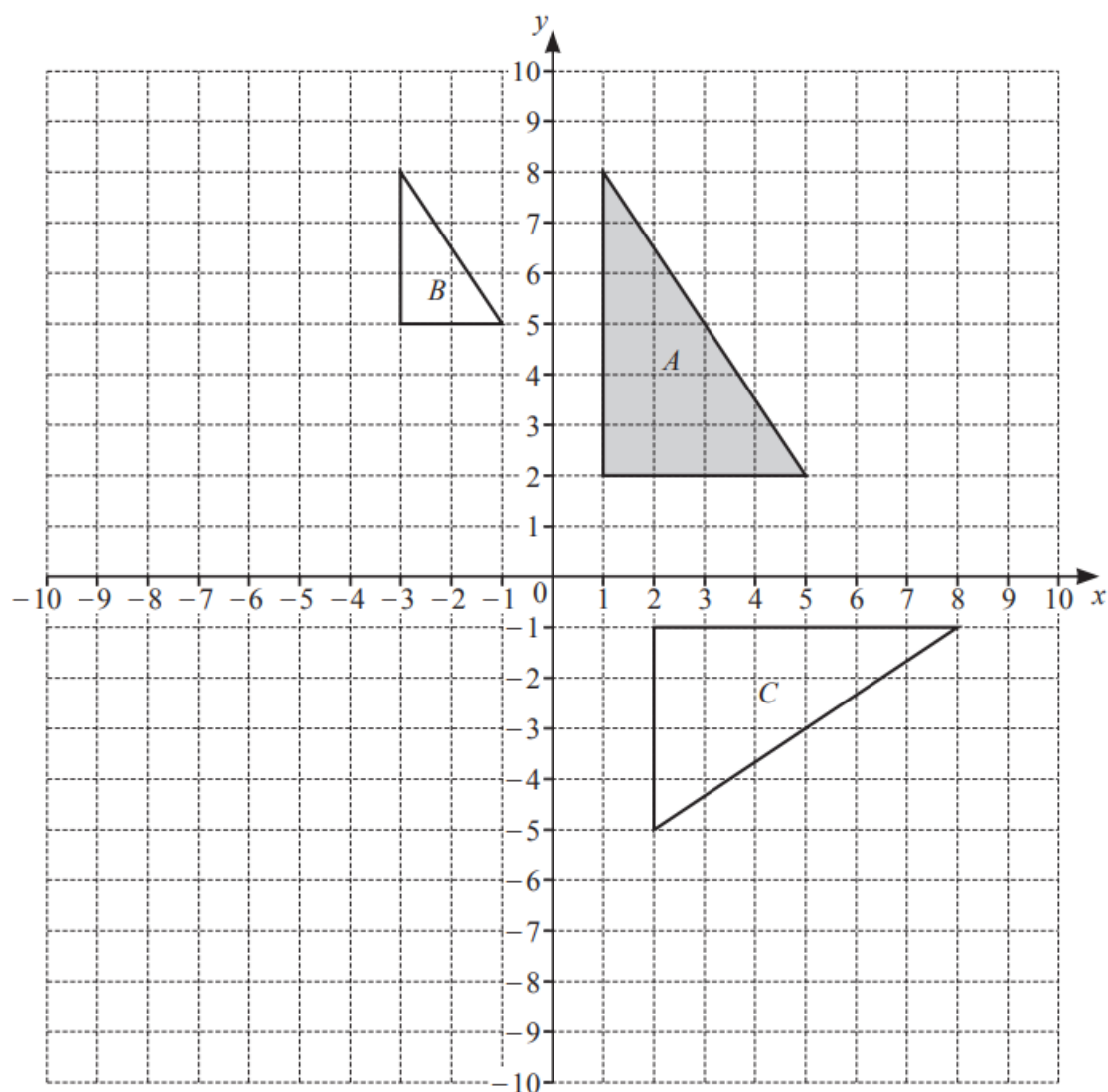
[2]

ii) triangle A after a translation by the vector $\begin{pmatrix} 3 \\ -5 \end{pmatrix}$.

[2]

(4 marks)

4 (a)



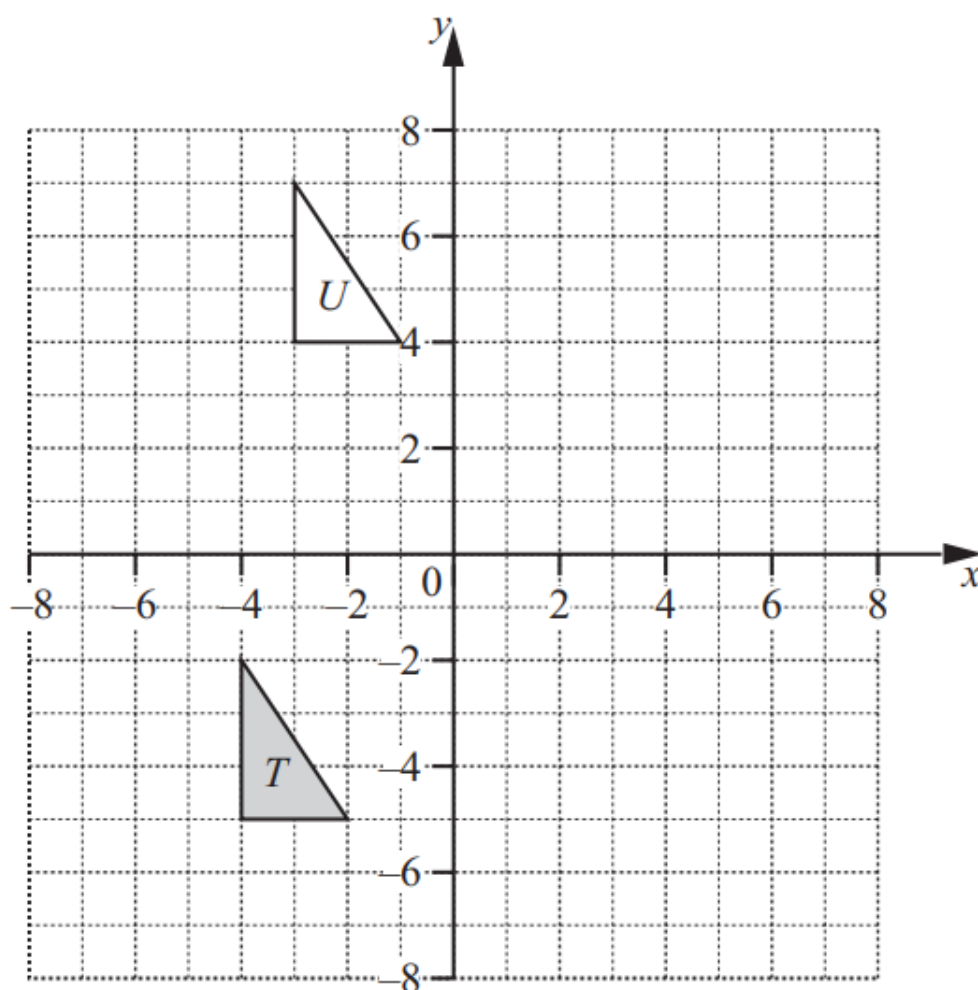
Draw the image of triangle A after a reflection in the line $y = -x$.

(2 marks)

(b) Draw the image of triangle A after a translation by the vector $\begin{pmatrix} -2 \\ -9 \end{pmatrix}$.

(2 marks)

5 (a)



i) Draw the reflection of triangle T in the line $x = 0$.

[2]

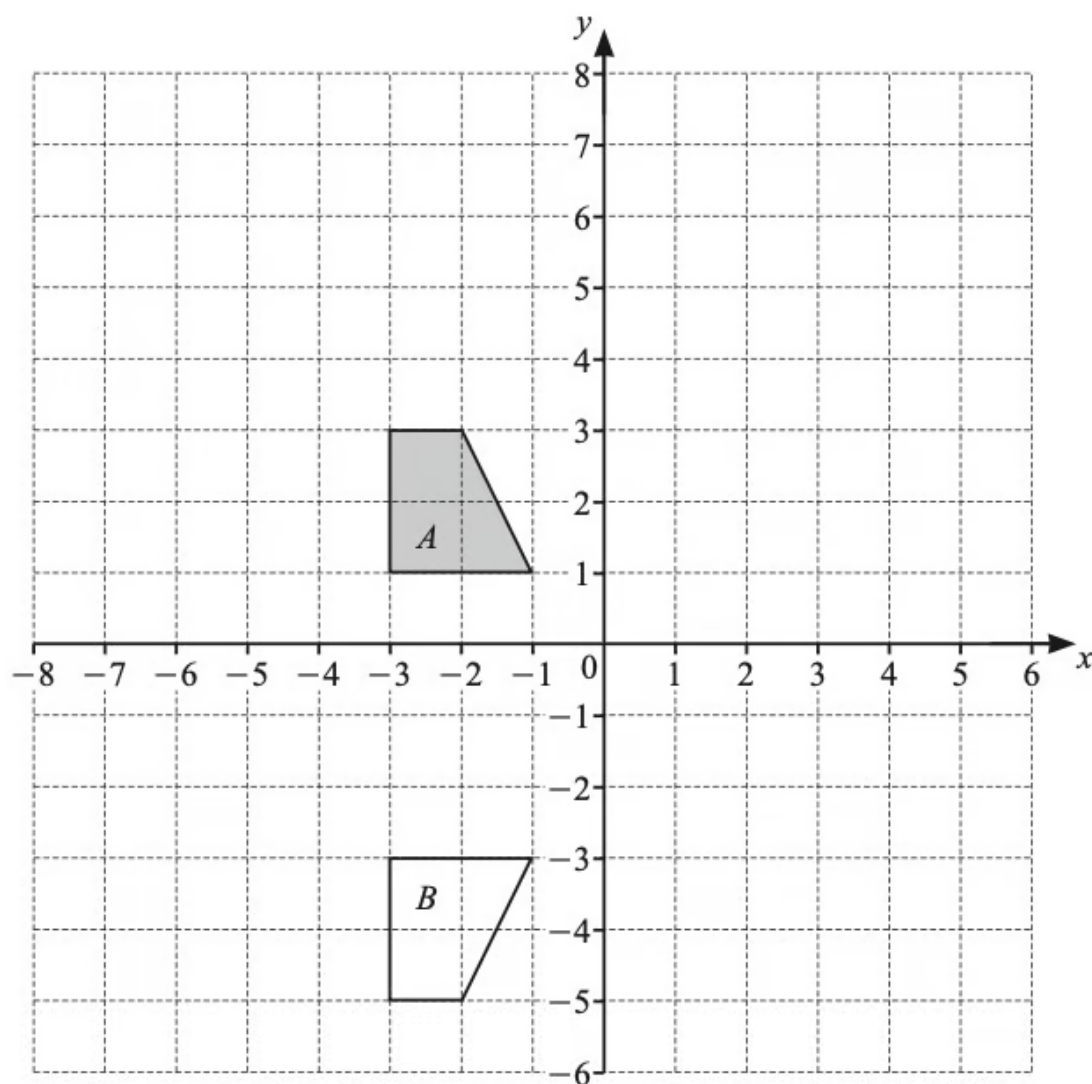
ii) Draw the rotation of triangle T about $(-2, -1)$ through 90° clockwise.

[2]

(4 marks)

(b) Describe fully the **single** transformation that maps triangle T onto triangle U .

(2 marks)



On the grid, draw the image of

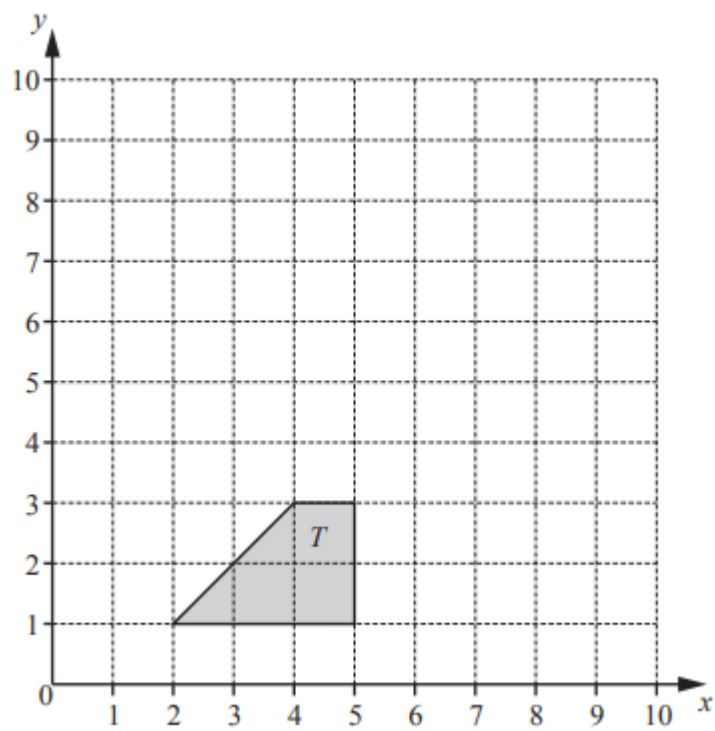
- i) shape *A* after a translation by the vector $\begin{pmatrix} -3 \\ 4 \end{pmatrix}$,

[2]

- ii) shape *A* after a rotation through 180° about $(0, 0)$,

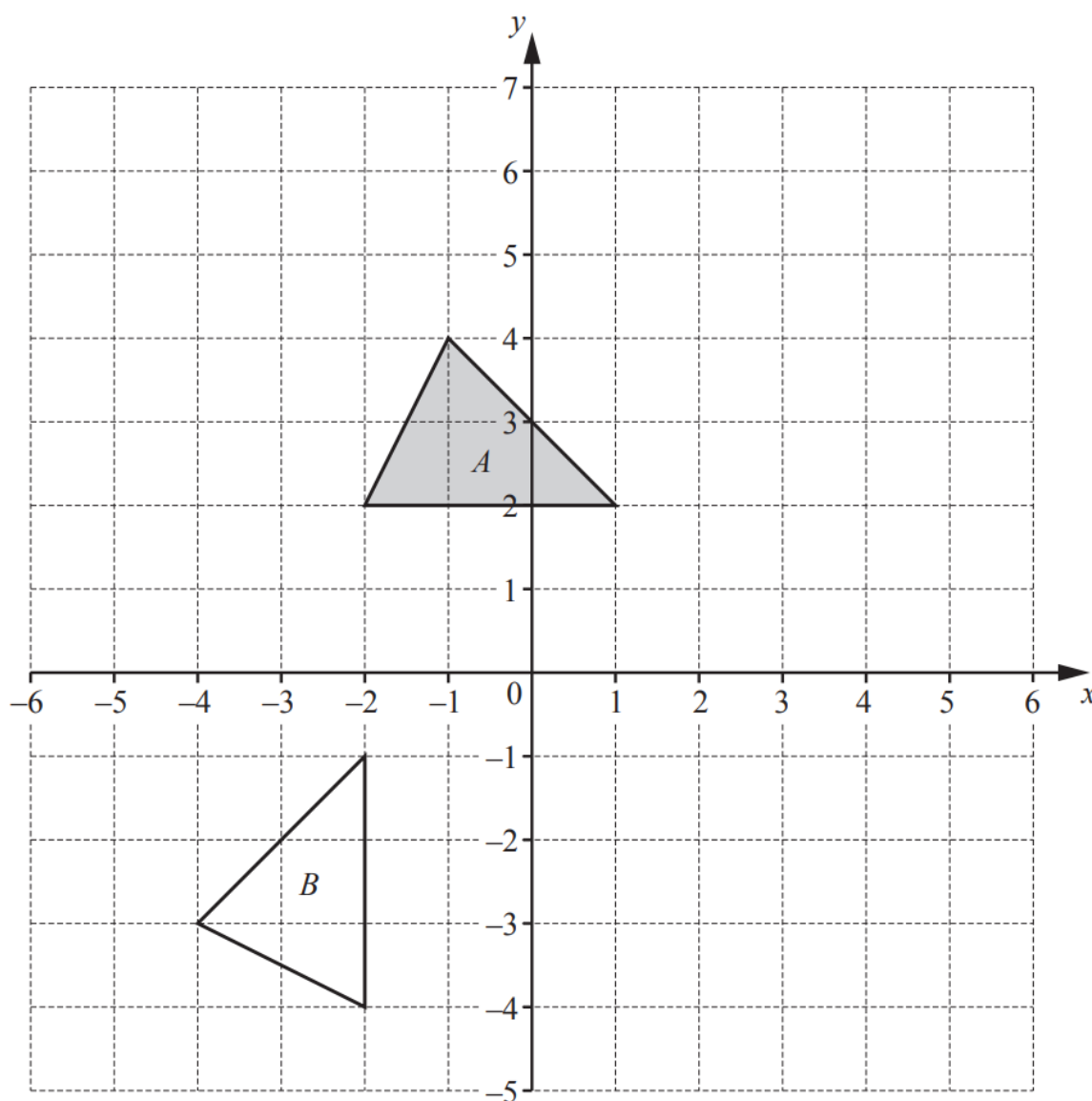
[2]

(4 marks)



Reflect shape T in the line $y = x$.

(2 marks)



On the grid, draw the image of

- i) triangle *A* after a translation by the vector $\begin{pmatrix} -3 \\ 2 \end{pmatrix}$.

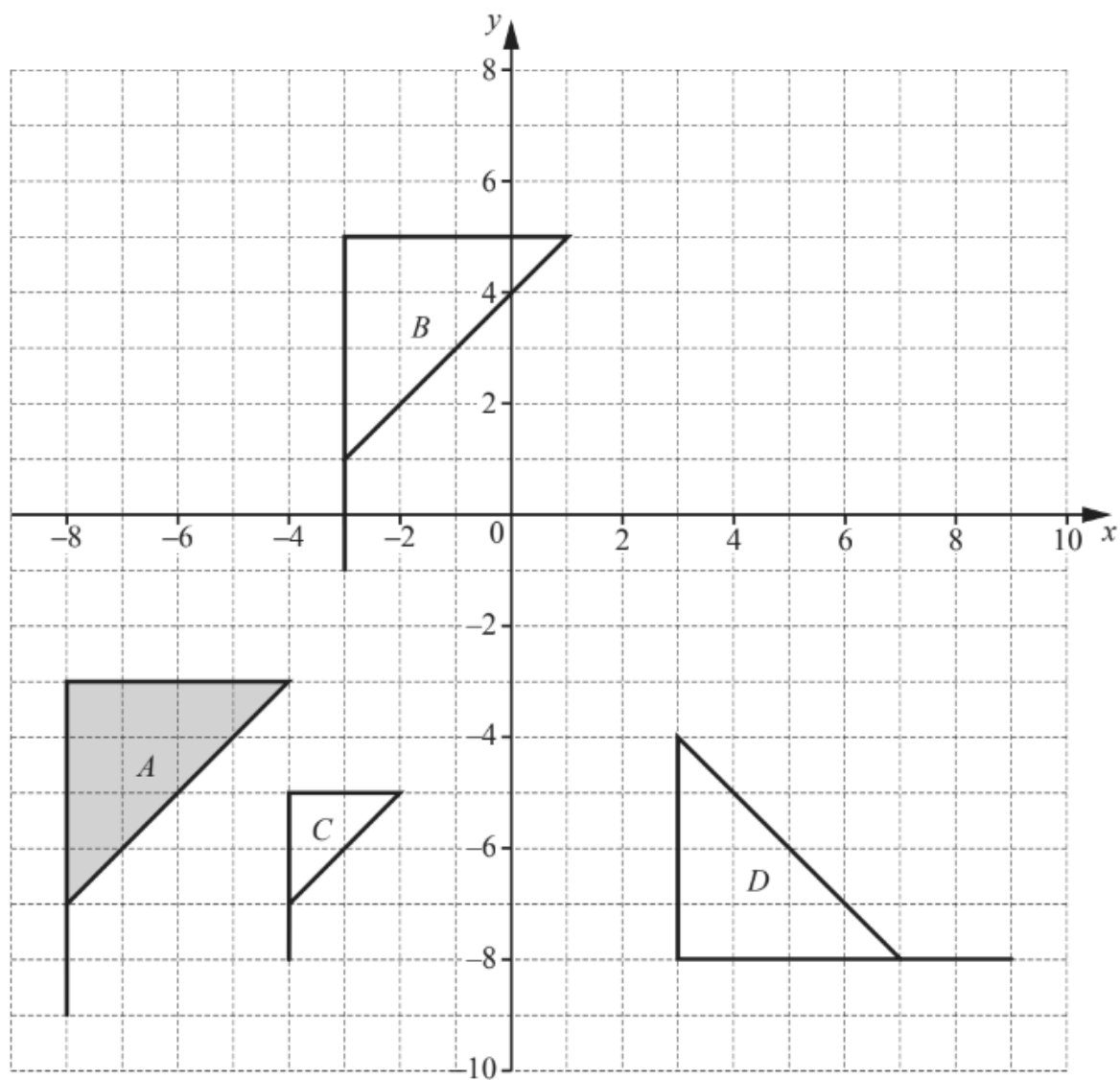
[2]

- ii) triangle *A* after a reflection in the line $y = x$.

[2]

(4 marks)

9 (a)

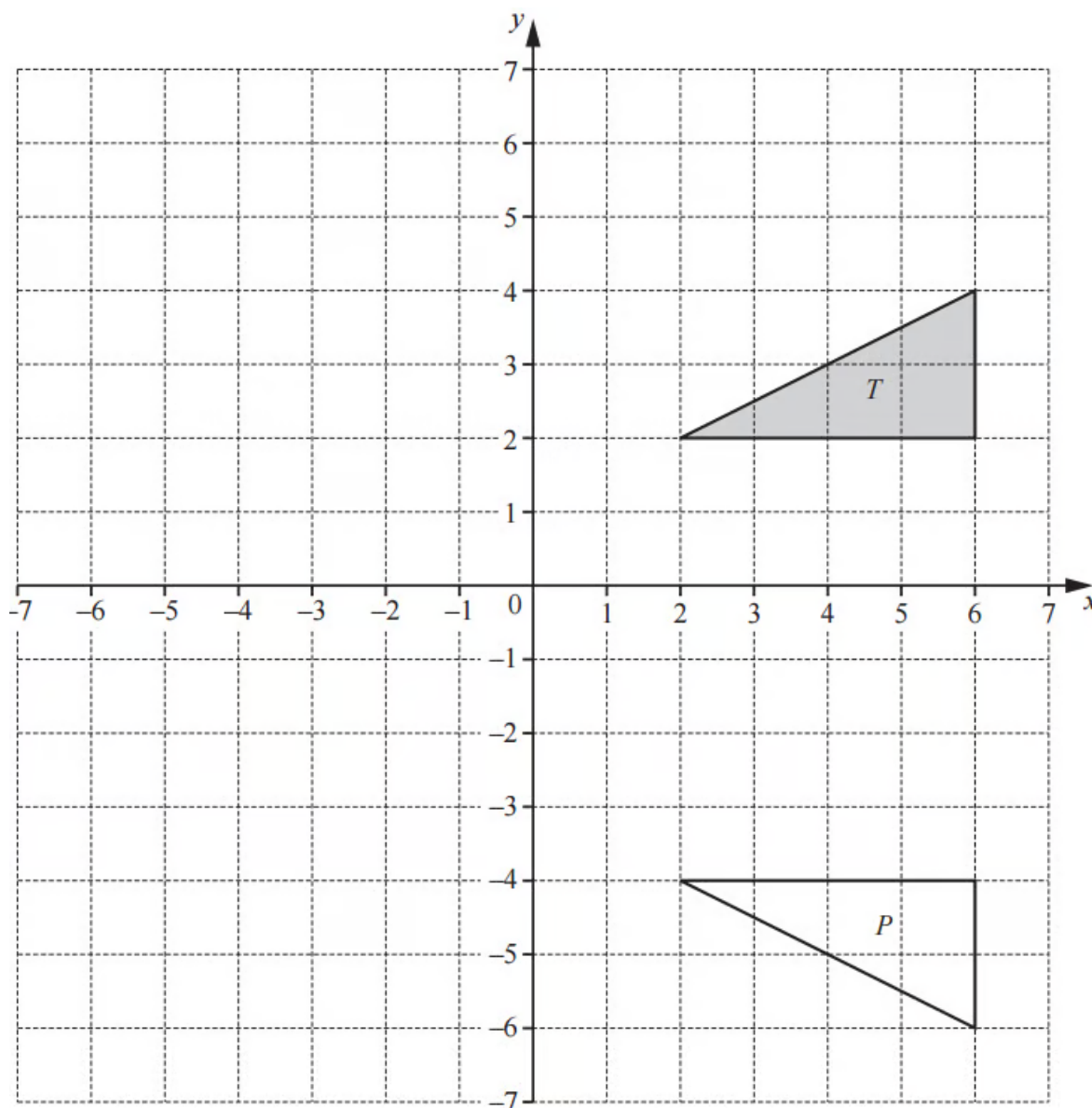


Describe fully the **single** transformation that maps flag A onto flag B.

(2 marks)

(b) Draw the reflection of flag A in the line $y = -1$.

(2 marks)



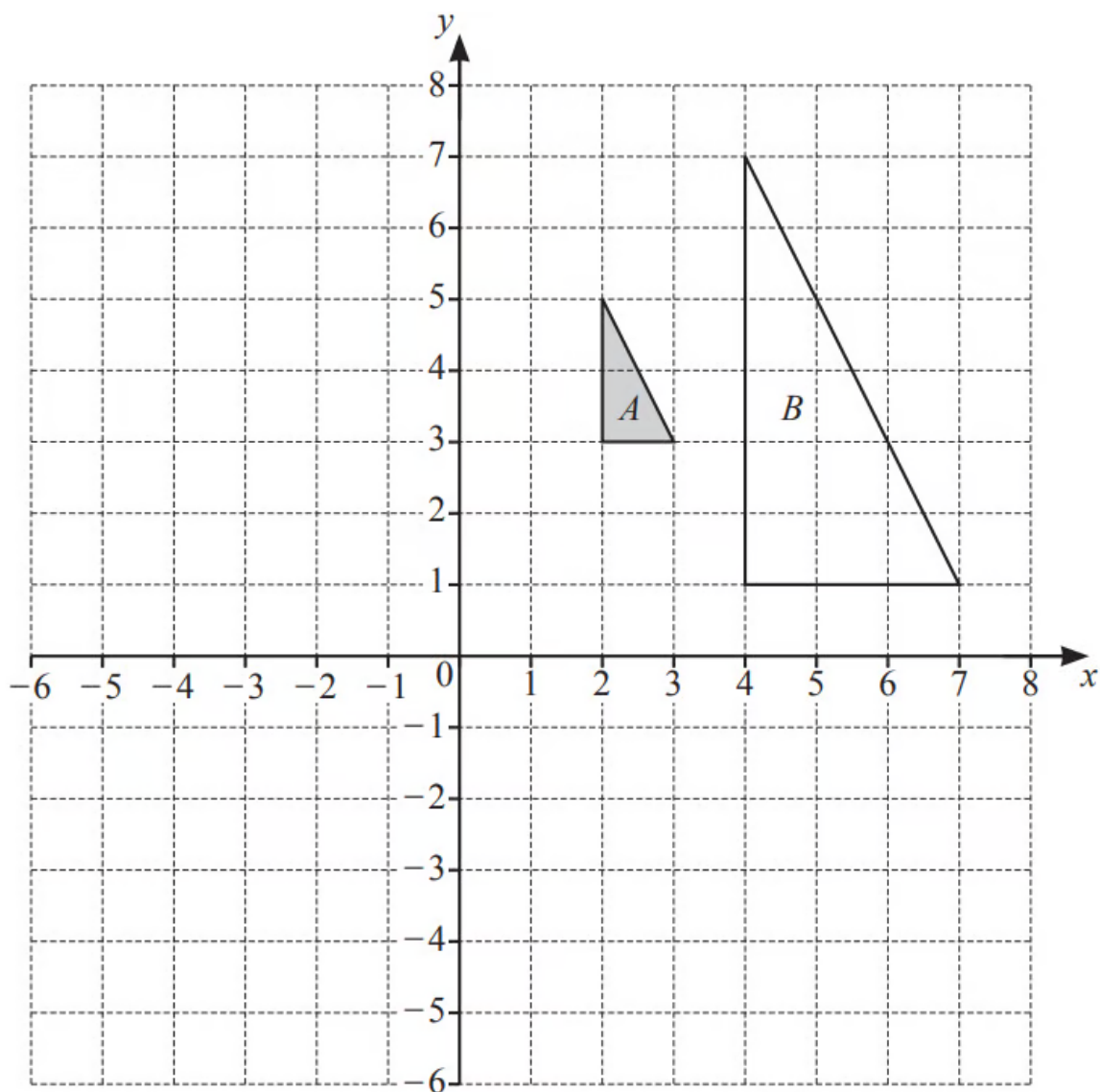
- i) Translate triangle T by the vector $\begin{pmatrix} -2 \\ -5 \end{pmatrix}$.

[2]

- ii) Rotate triangle T through 90° anticlockwise about $(0, 0)$.

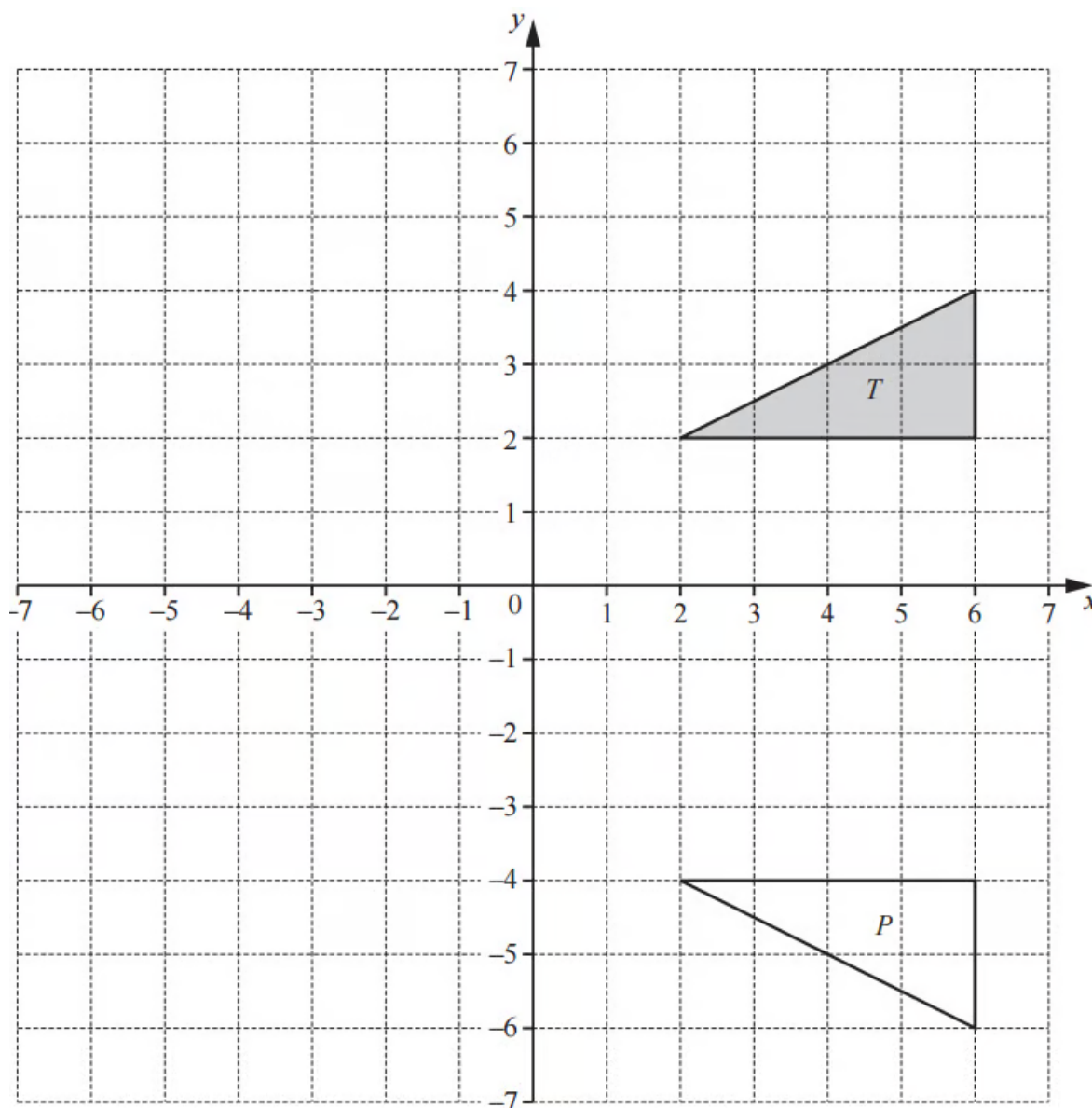
[2]

(4 marks)



Describe fully the **single** transformation that maps triangle A onto triangle B.

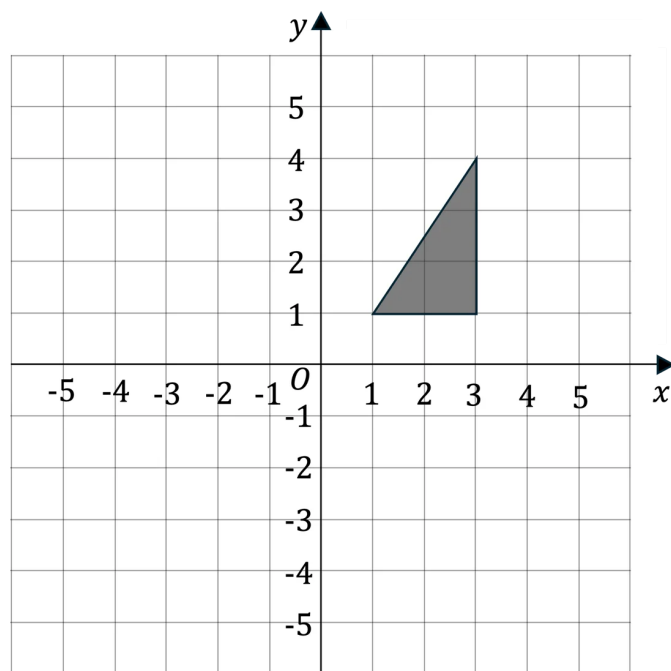
(3 marks)



Describe fully the **single** transformation that maps triangle T onto triangle P .

(2 marks)

13 (a)



Rotate the triangle above clockwise by 90° about the point $(0, 0)$ and label it A.

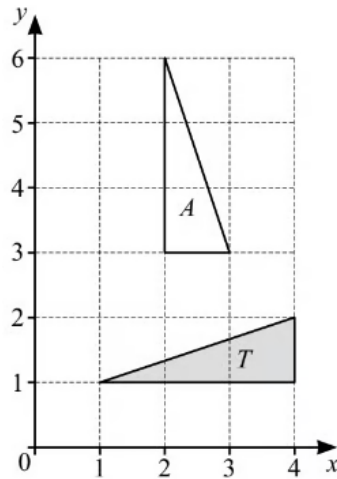
(2 marks)

(b) Reflect the original shape in the line $x = -1$ and label it B.

(2 marks)

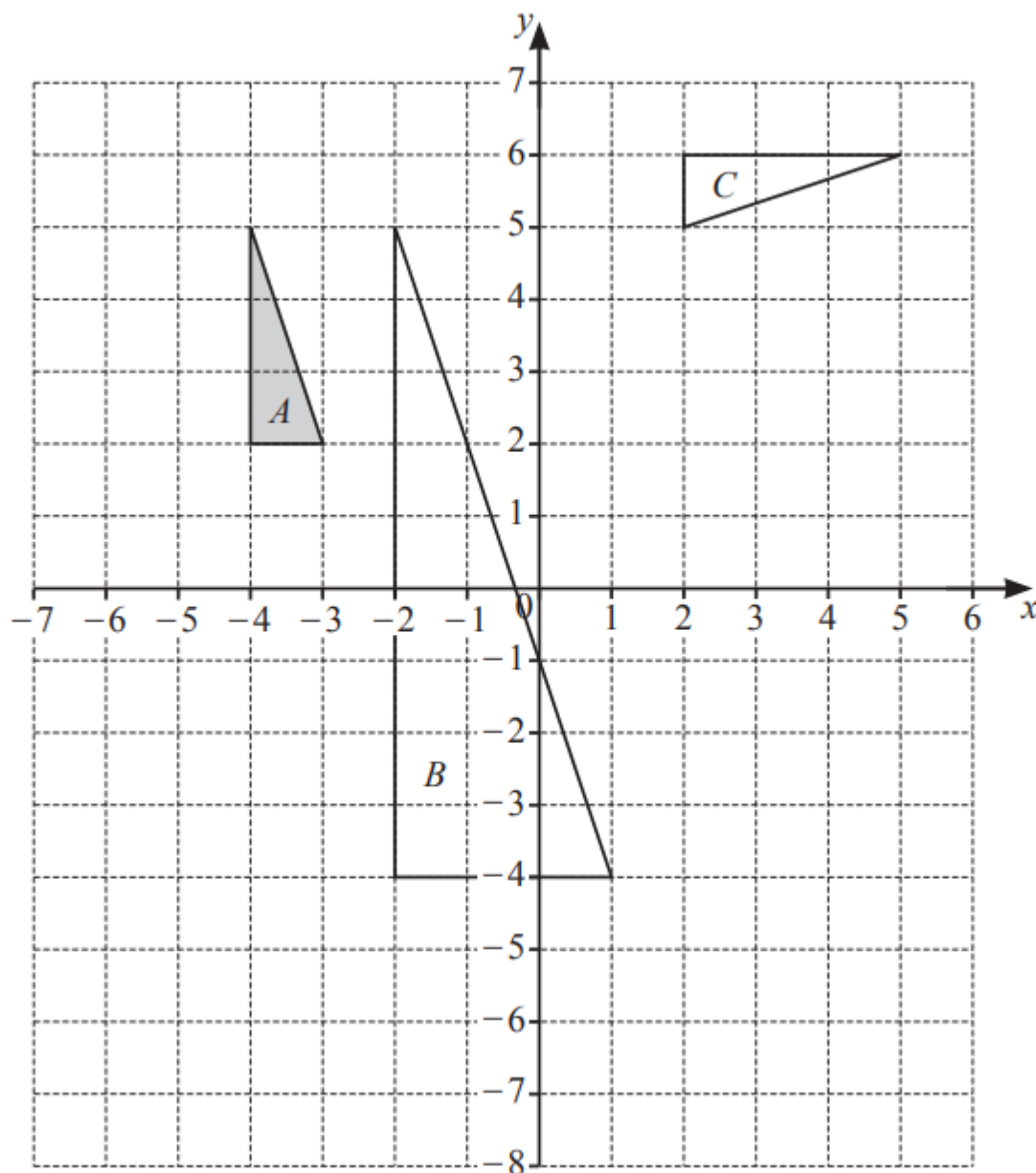
Hard Questions

1



Describe fully the **single** transformation that maps triangle T onto triangle A .

(3 marks)



Describe fully the **single** transformation that maps

i) shape *A* onto shape *B*,

[3]

ii) Describe fully the **single** transformation that maps shape *A* onto shape *C*.

[3]

(6 marks)

3 A line joins $A(1, 3)$ to $B(5, 8)$.

The line AB is transformed to the line PQ .

Find the co-ordinates of P and the co-ordinates of Q after AB is transformed by

i) a rotation through 90° anticlockwise about the origin,

$P(\dots\dots\dots, \dots\dots\dots)$

$Q(\dots\dots\dots, \dots\dots\dots)$ [2]

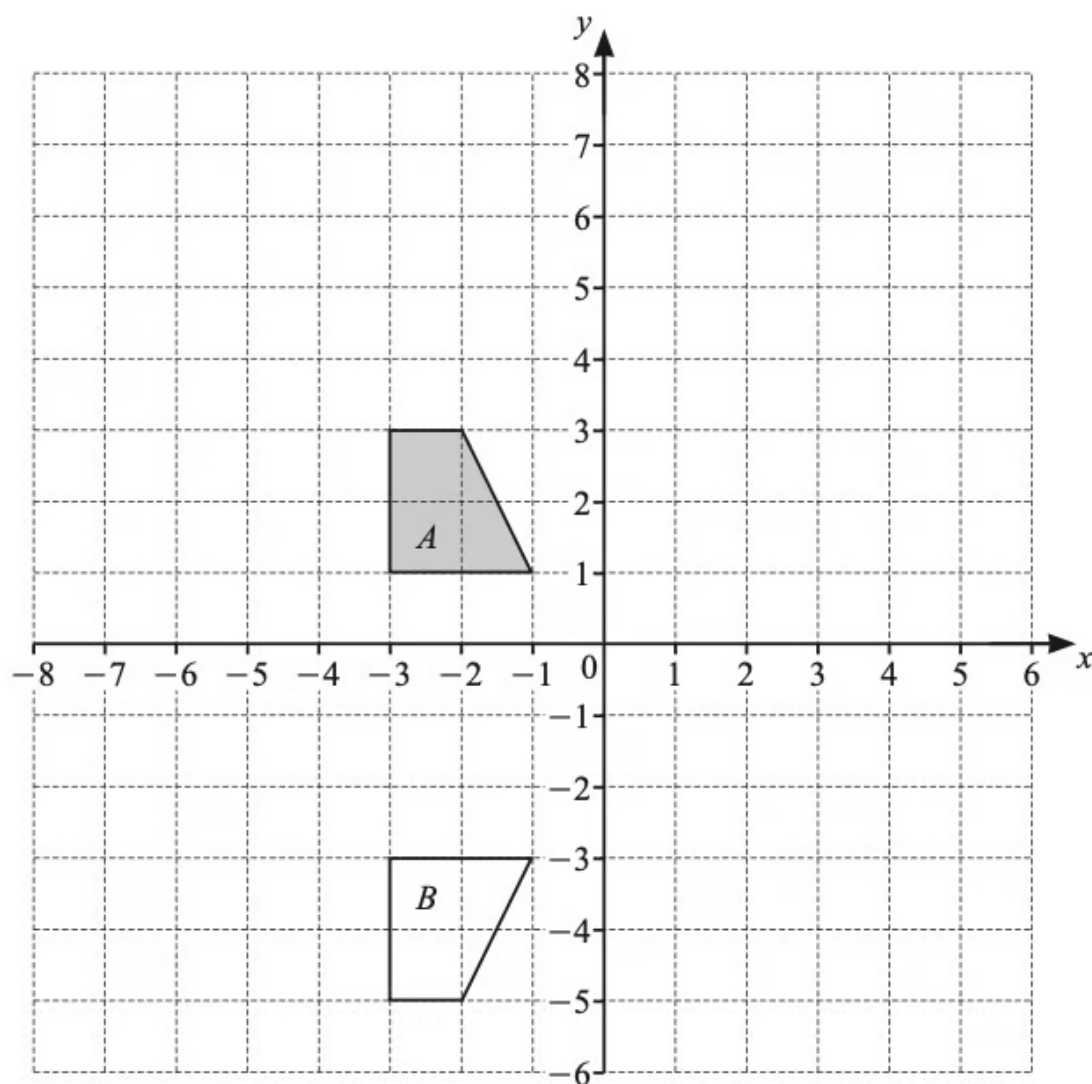
ii) a reflection in the line $x = 2$,

$P(\dots\dots\dots, \dots\dots\dots)$

$Q(\dots\dots\dots, \dots\dots\dots)$ [2]

(4 marks)

4 (a)



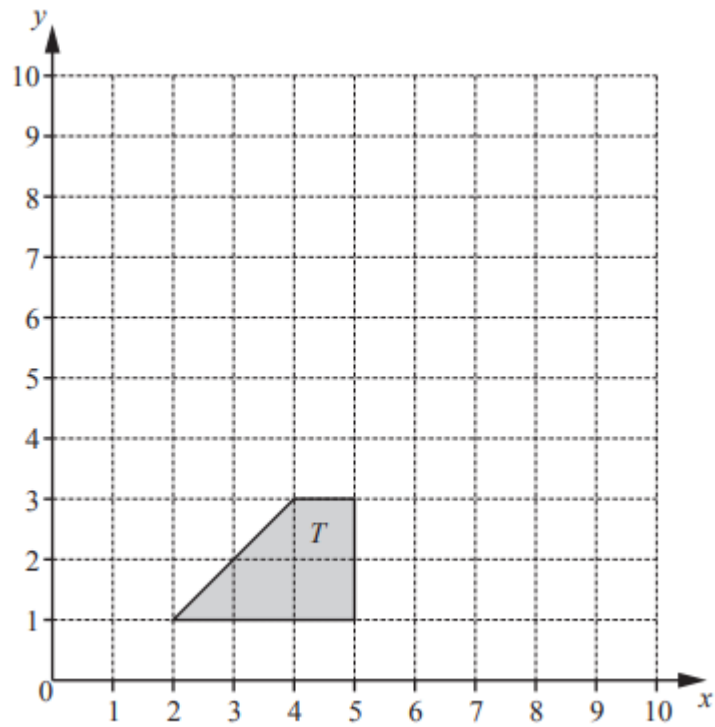
Describe fully the **single** transformation that maps shape A onto shape B.

(2 marks)

- (b) On the grid, draw the image of shape A after an enlargement, scale factor 2, centre $(-7, 0)$.

(2 marks)

5



- i) Translate shape *T* by the vector $\begin{pmatrix} -1 \\ 6 \end{pmatrix}$. Label the image *A*.

[2]

- ii) Rotate shape *T* about the point (5, 3) through 180° . Label the image *B*.

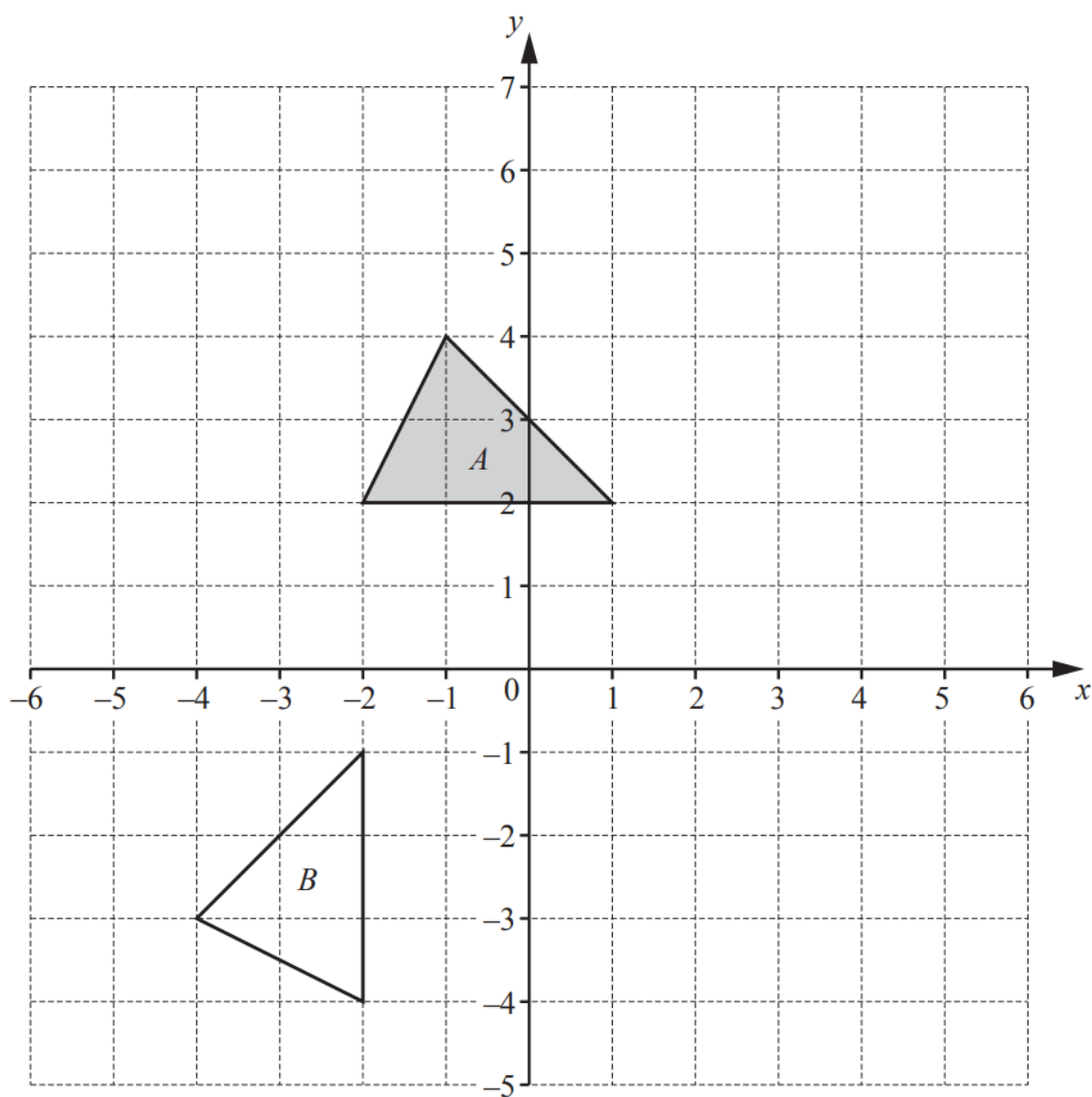
[2]

- iii) Describe fully the **single** transformation that maps shape *A* onto shape *B*.

[3]

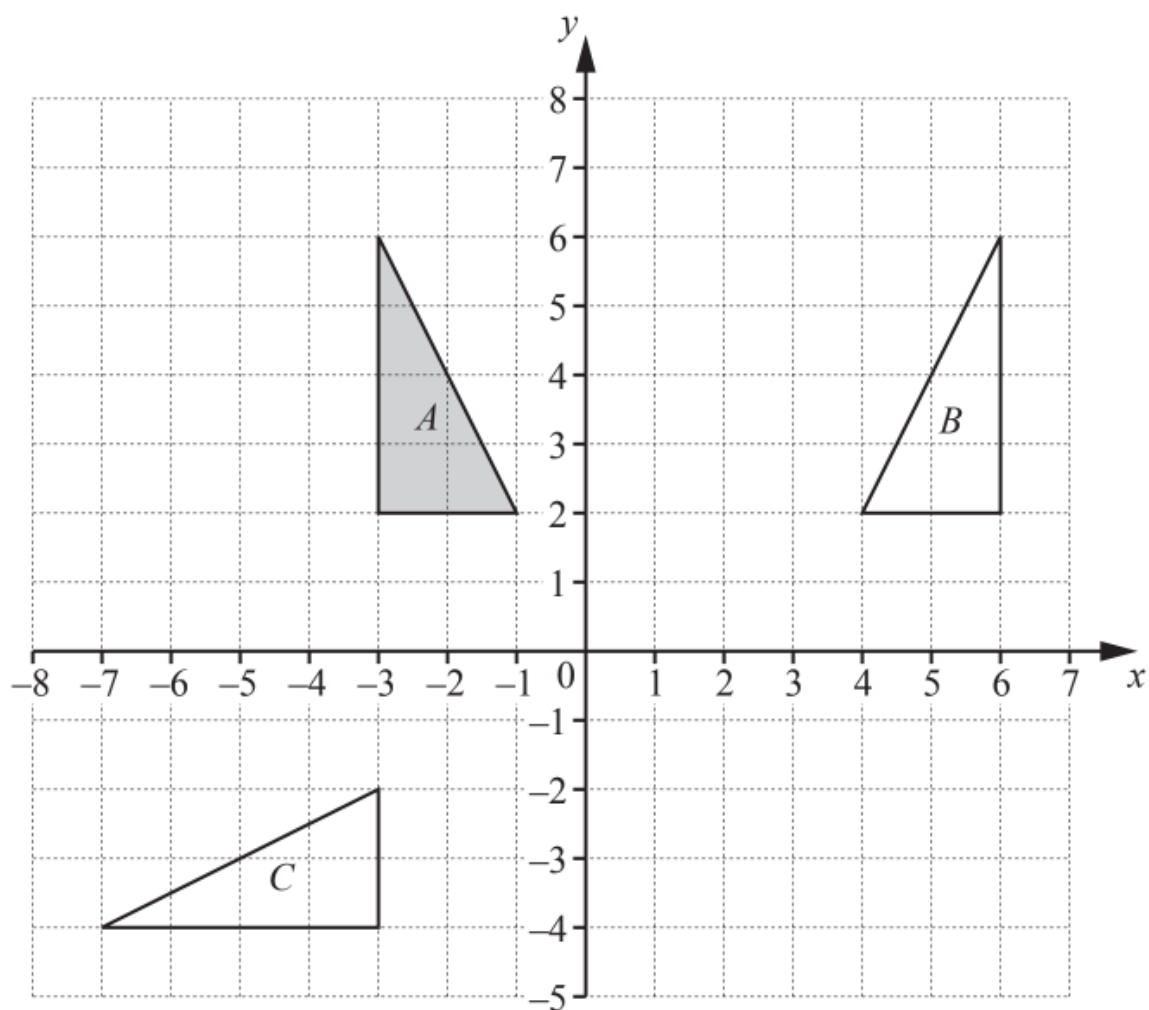
(7 marks)

6



Describe fully the **single** transformation that maps triangle *A* onto triangle *B*.

(3 marks)



Describe fully the **single** transformation that maps

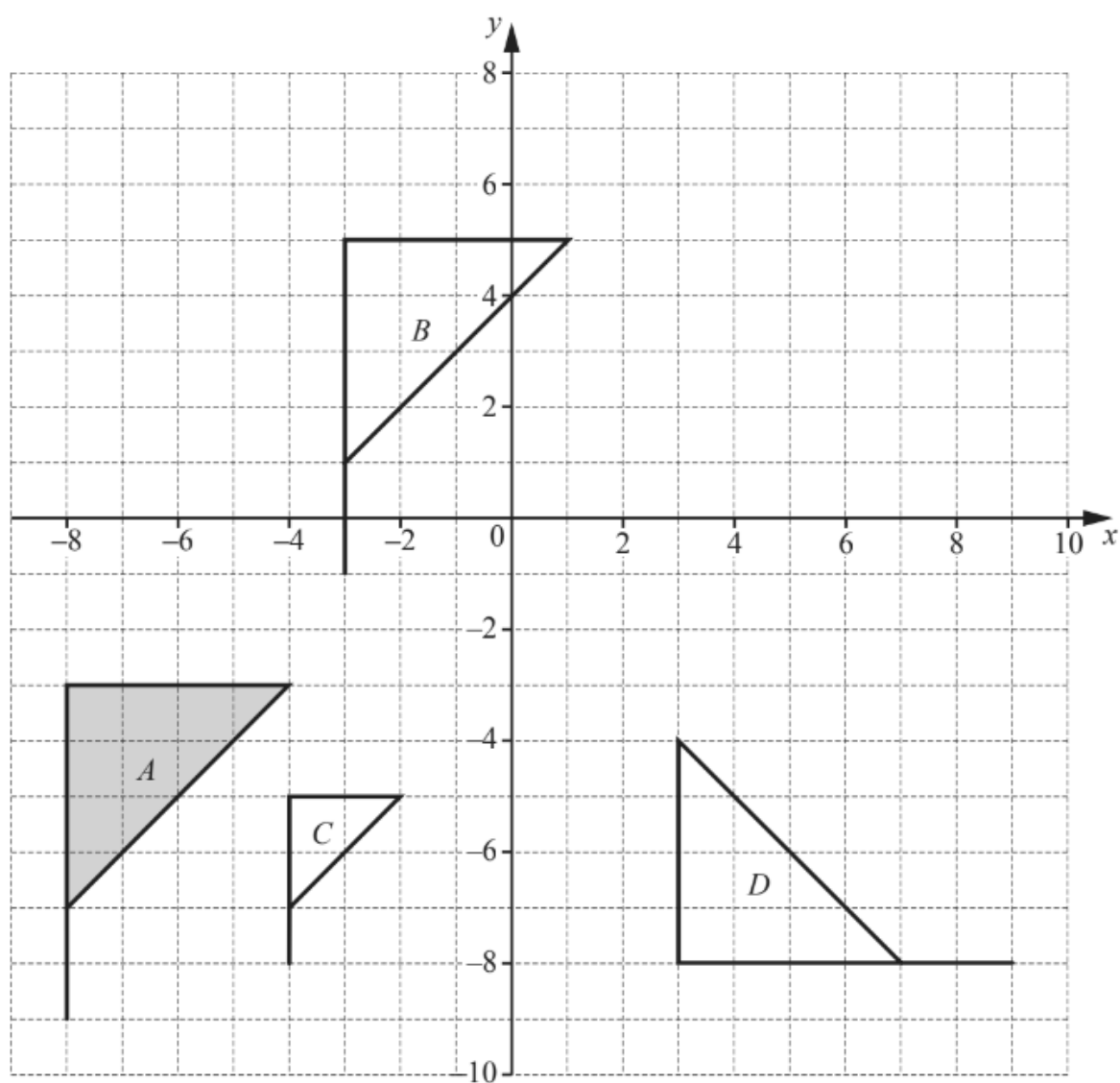
i) triangle A onto triangle B,

[2]

ii) triangle A onto triangle C.

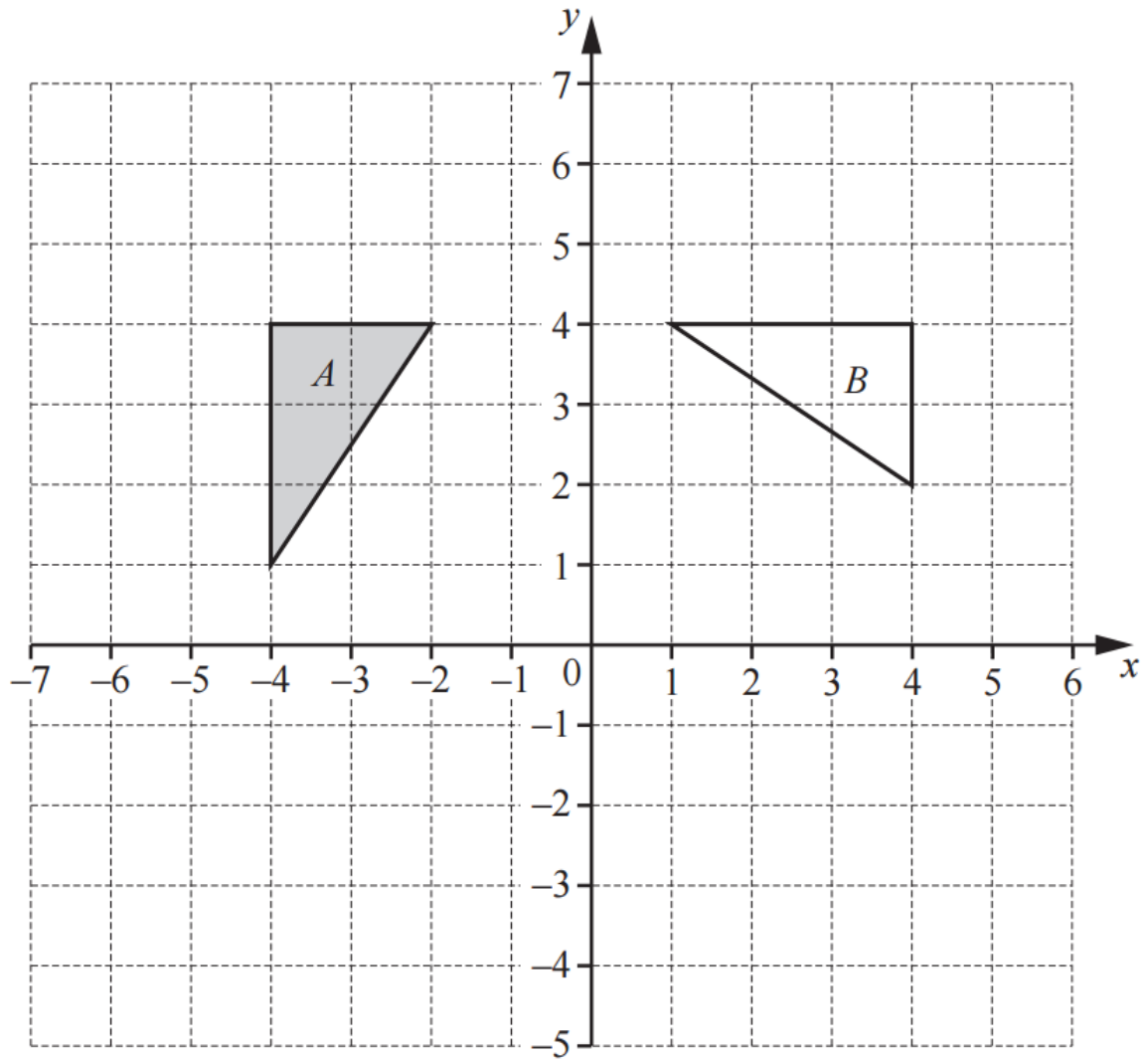
[3]

8



Describe fully the **single** transformation that maps flag *A* onto flag *D*.

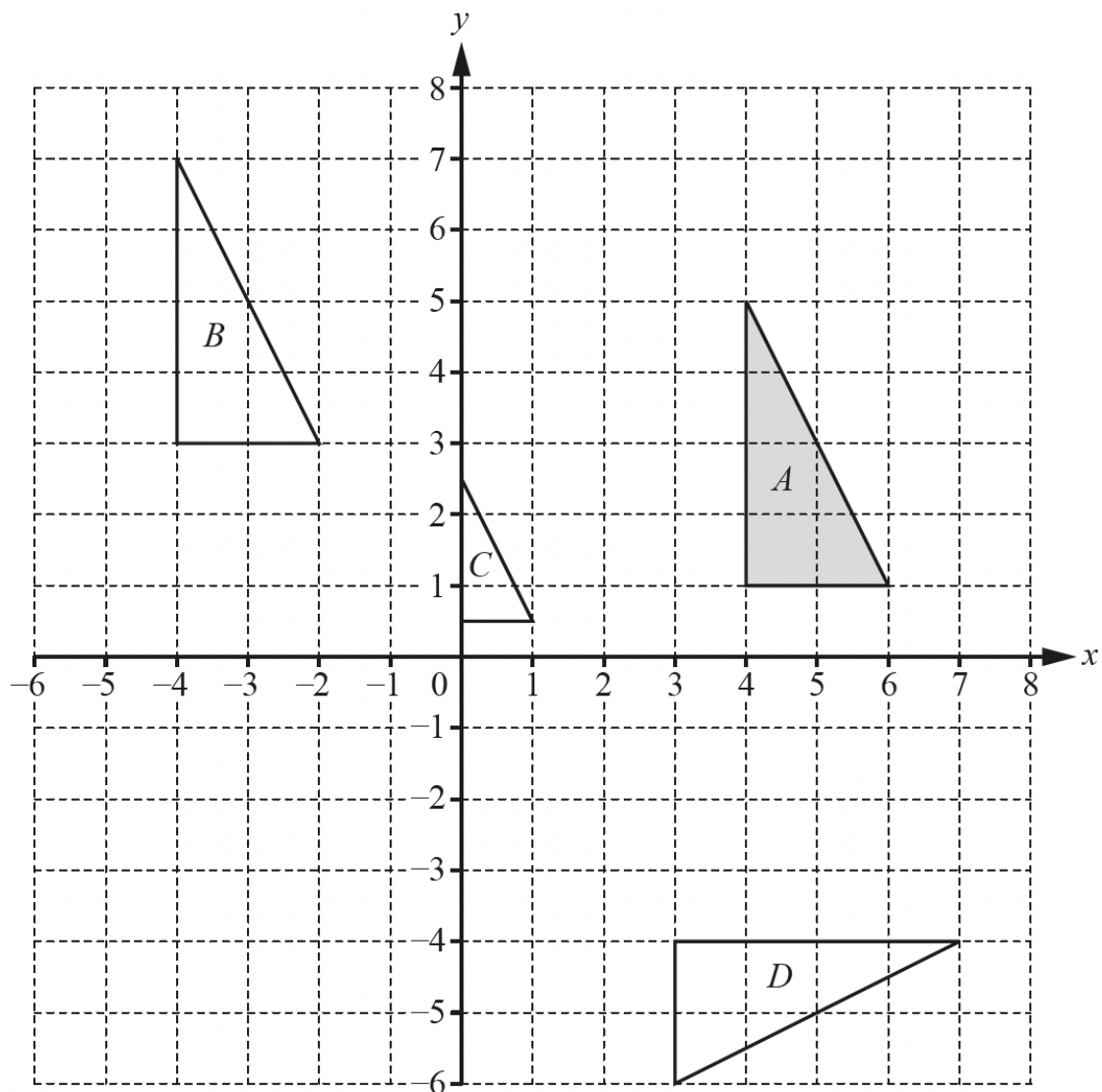
(3 marks)



Describe fully the **single** transformation that maps triangle A onto triangle B.

(3 marks)

10 (a)

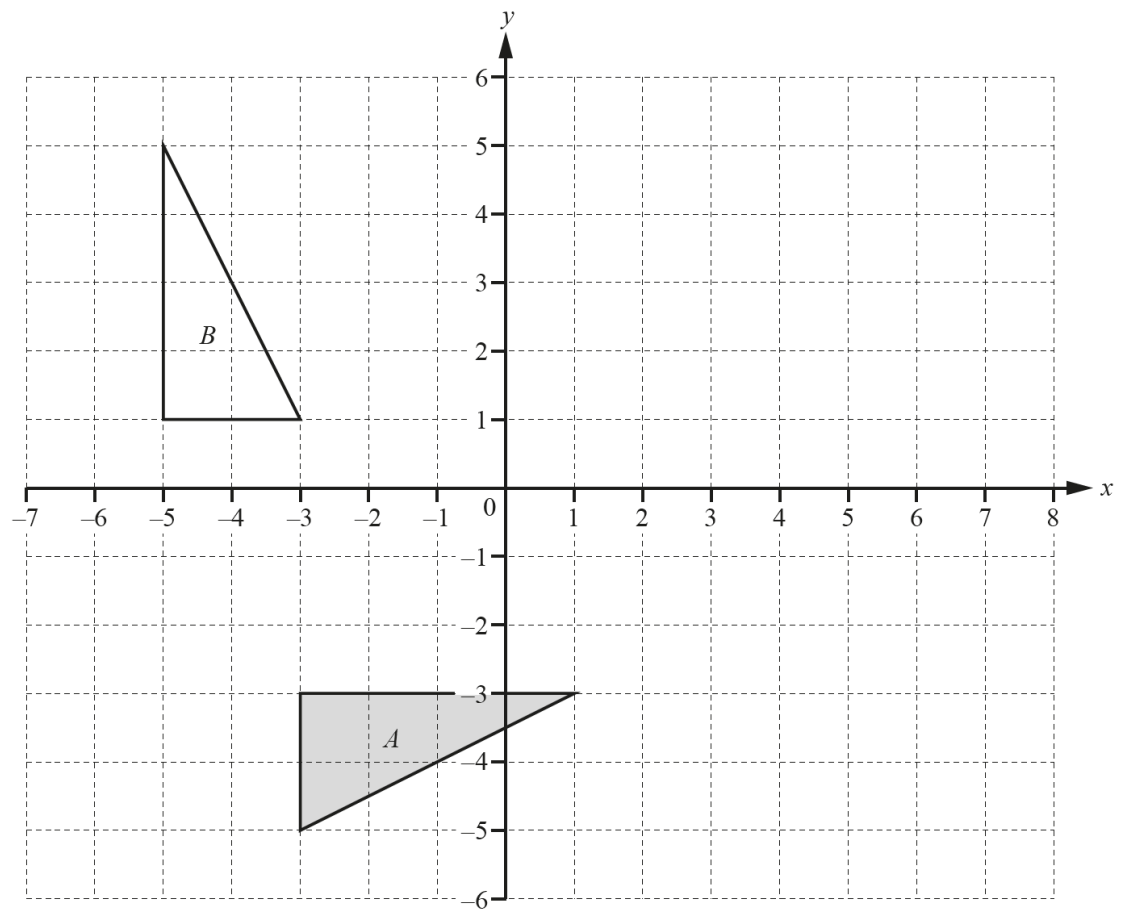


Describe fully the single transformation that maps triangle A onto triangle D.

(3 marks)

(b) On the grid, draw the image of triangle A after an enlargement by scale factor 2, centre (7, 3).

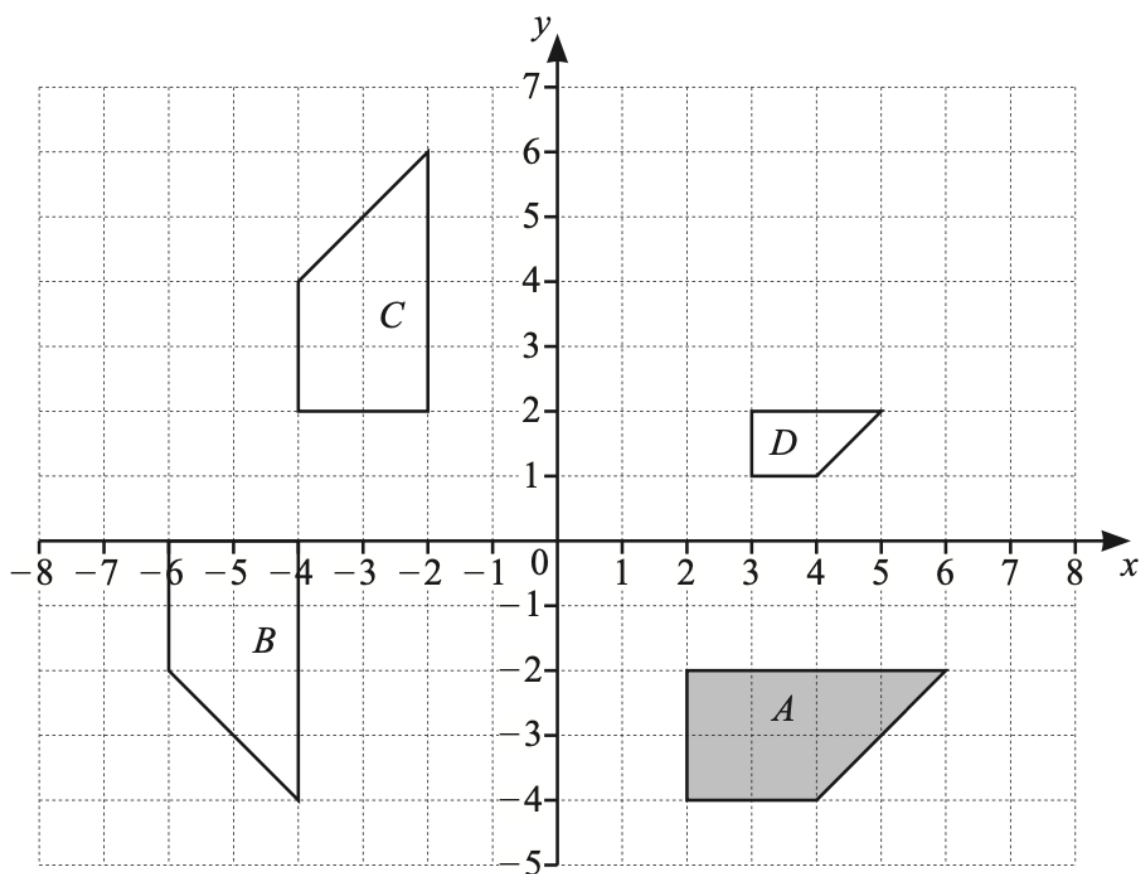
(2 marks)



Describe fully the **single** transformation that maps triangle *A* onto triangle *B*.

(3 marks)

12 (a)

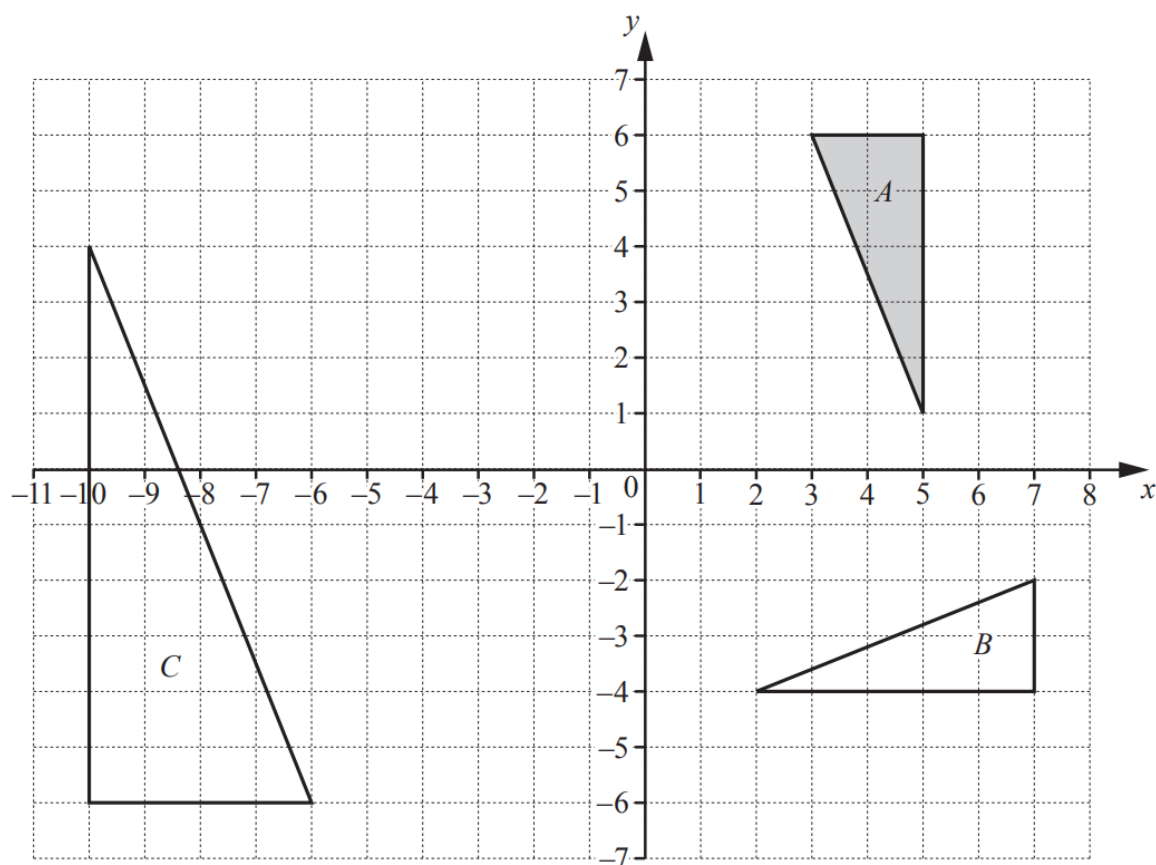


Describe fully the single transformation that maps shape A onto shape B.

(3 marks)

(b) Describe fully the single transformation that maps shape A onto shape C.

(2 marks)

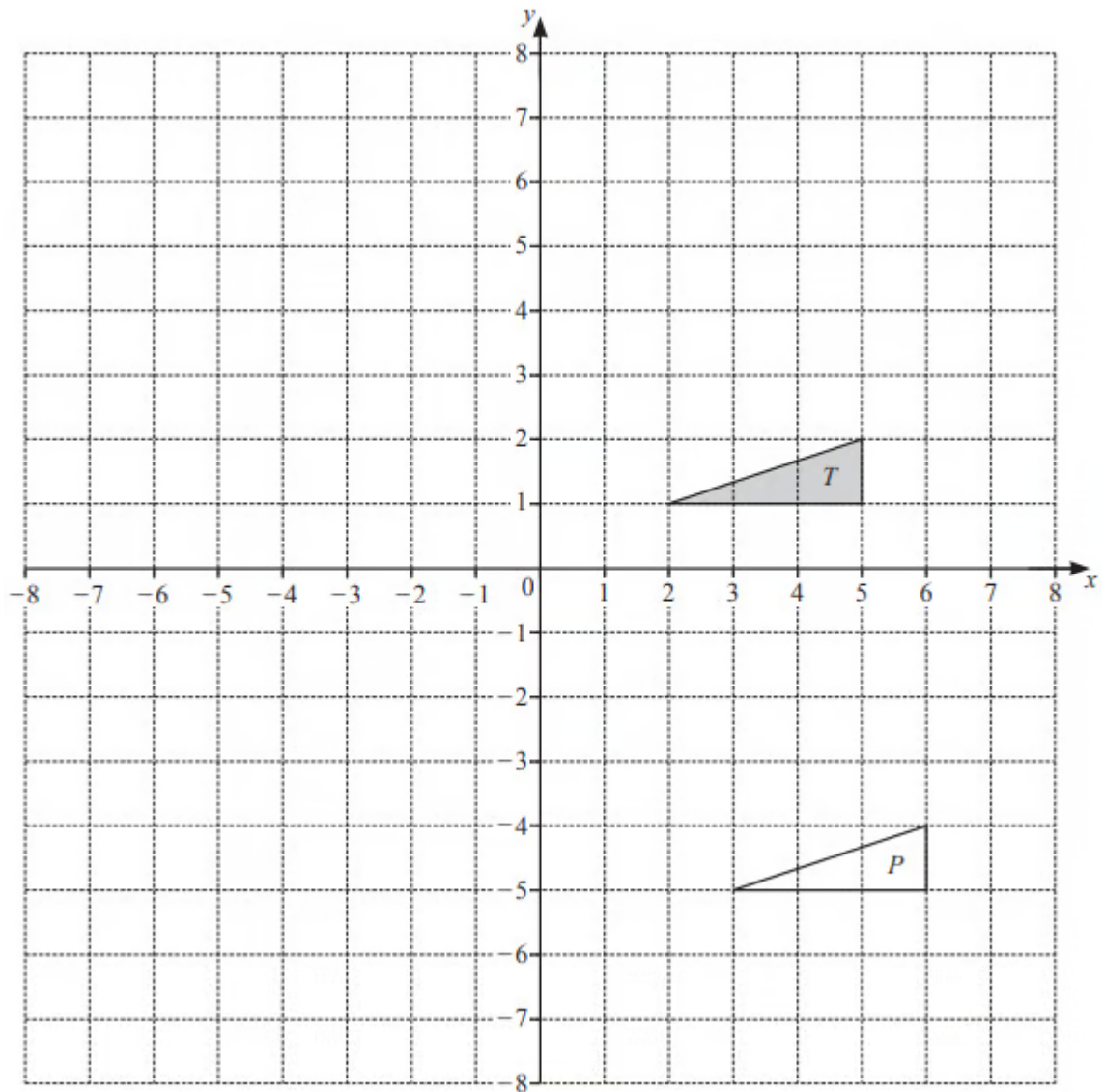


Describe fully the **single** transformation that maps triangle *A* onto triangle *B*.

(3 marks)

Very Hard Questions

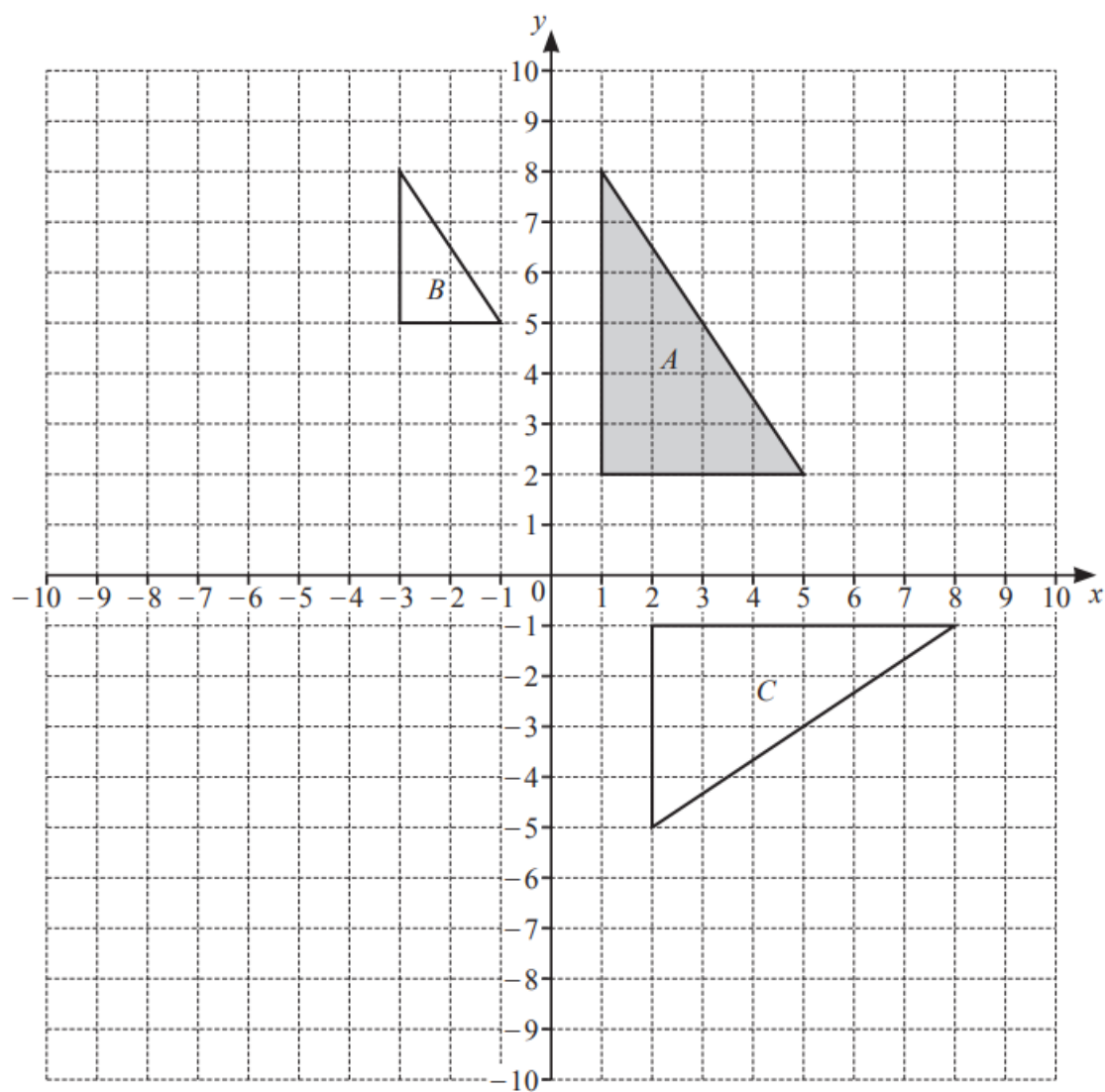
1



Enlarge triangle T by a scale factor of -2 , centre $(1, 0)$.

(2 marks)

2



Describe fully the **single** transformation that maps

i) triangle A onto triangle B,

[3]

ii) triangle A onto triangle C.

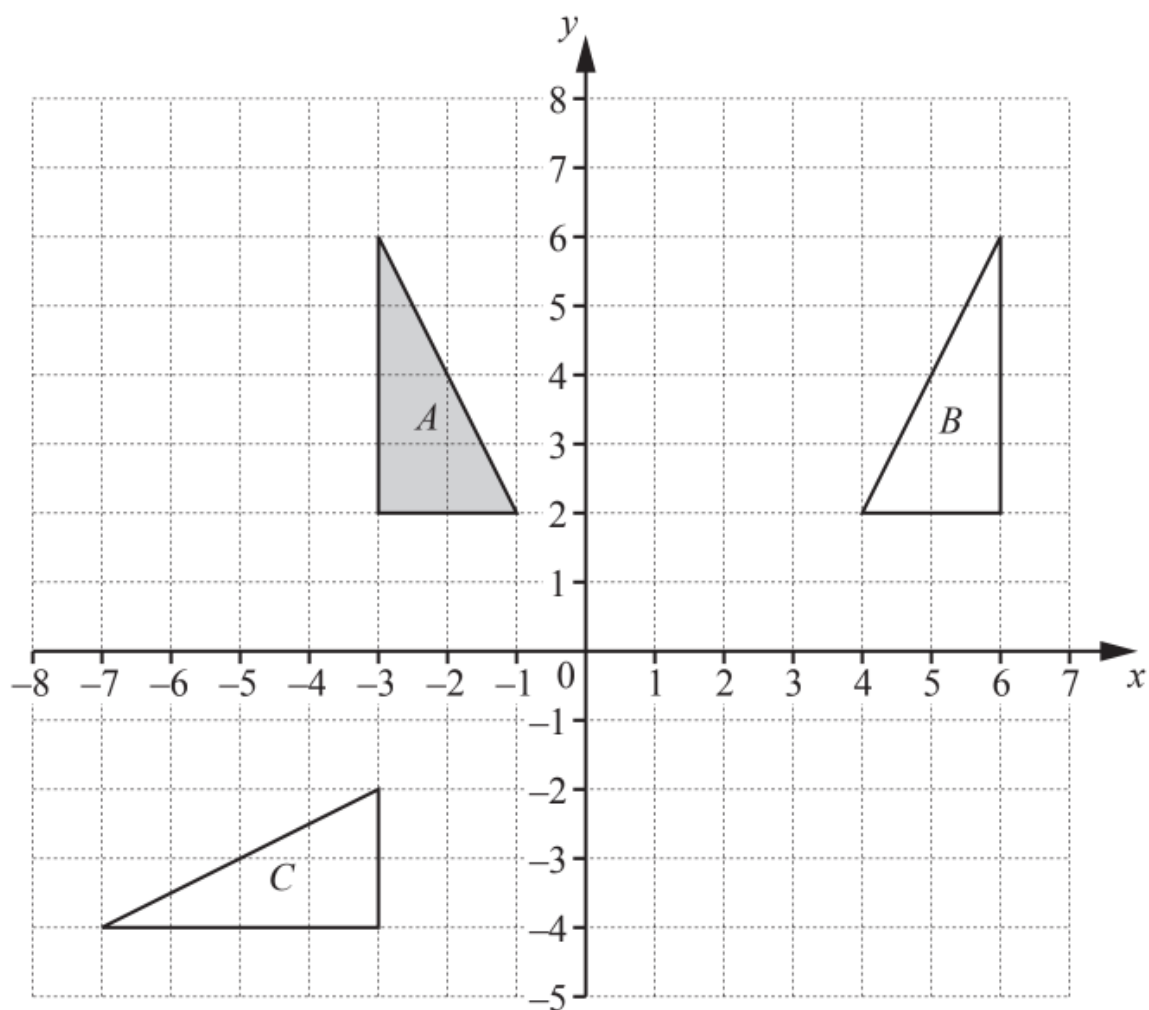
[3]

(6 marks)

- 3 A line joins $A(1, 3)$ to $B(5, 8)$.
The line AB is transformed to the line PQ .

Describe fully the **single** transformation that maps the line AB onto the line PQ where P is the point $(-2, -6)$ and Q is the point $(-10, -16)$.

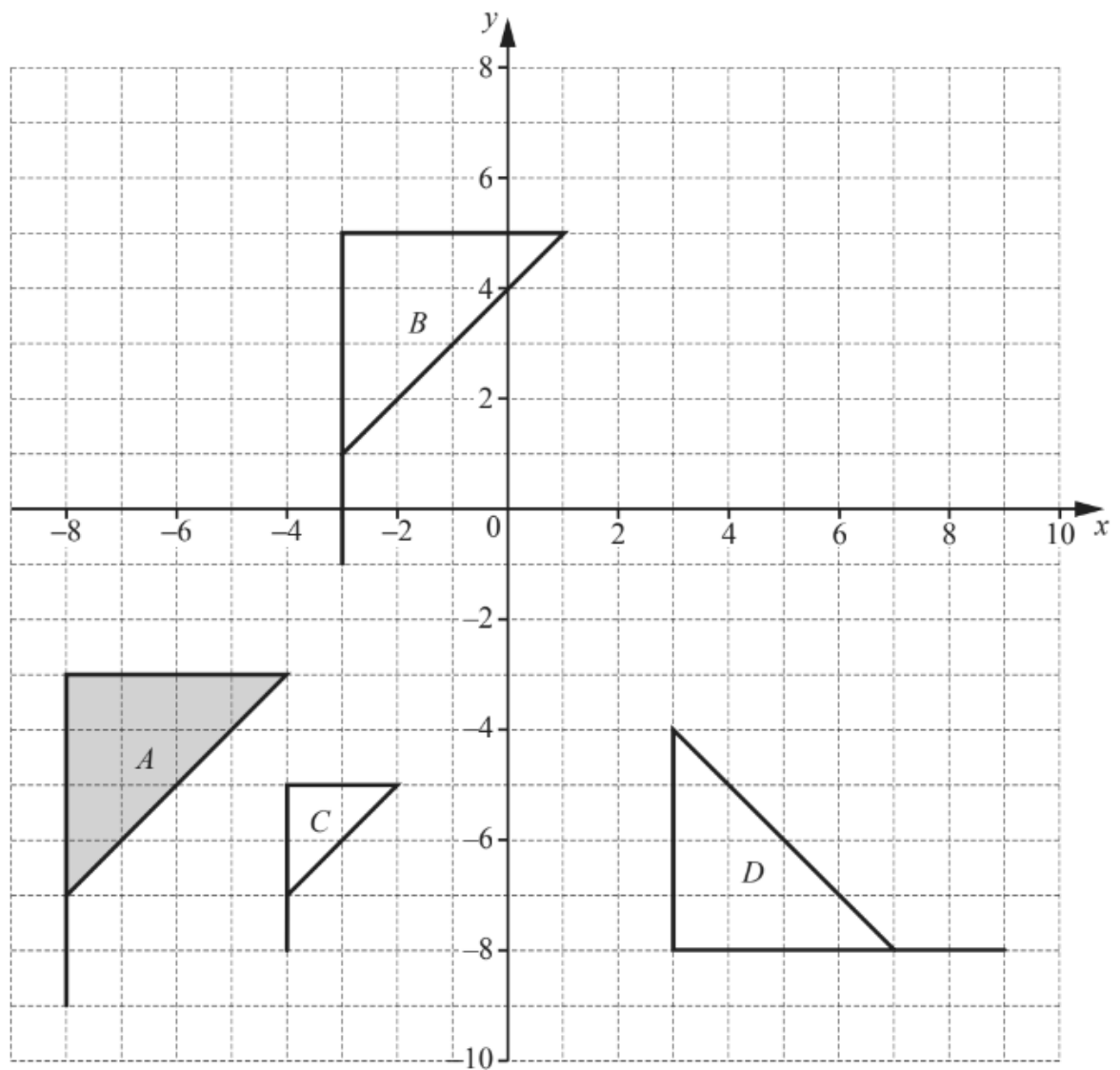
(3 marks)



On the grid, draw the image of triangle A after an enlargement, scale factor $-\frac{1}{2}$, centre $(3, 0)$,

(2 marks)

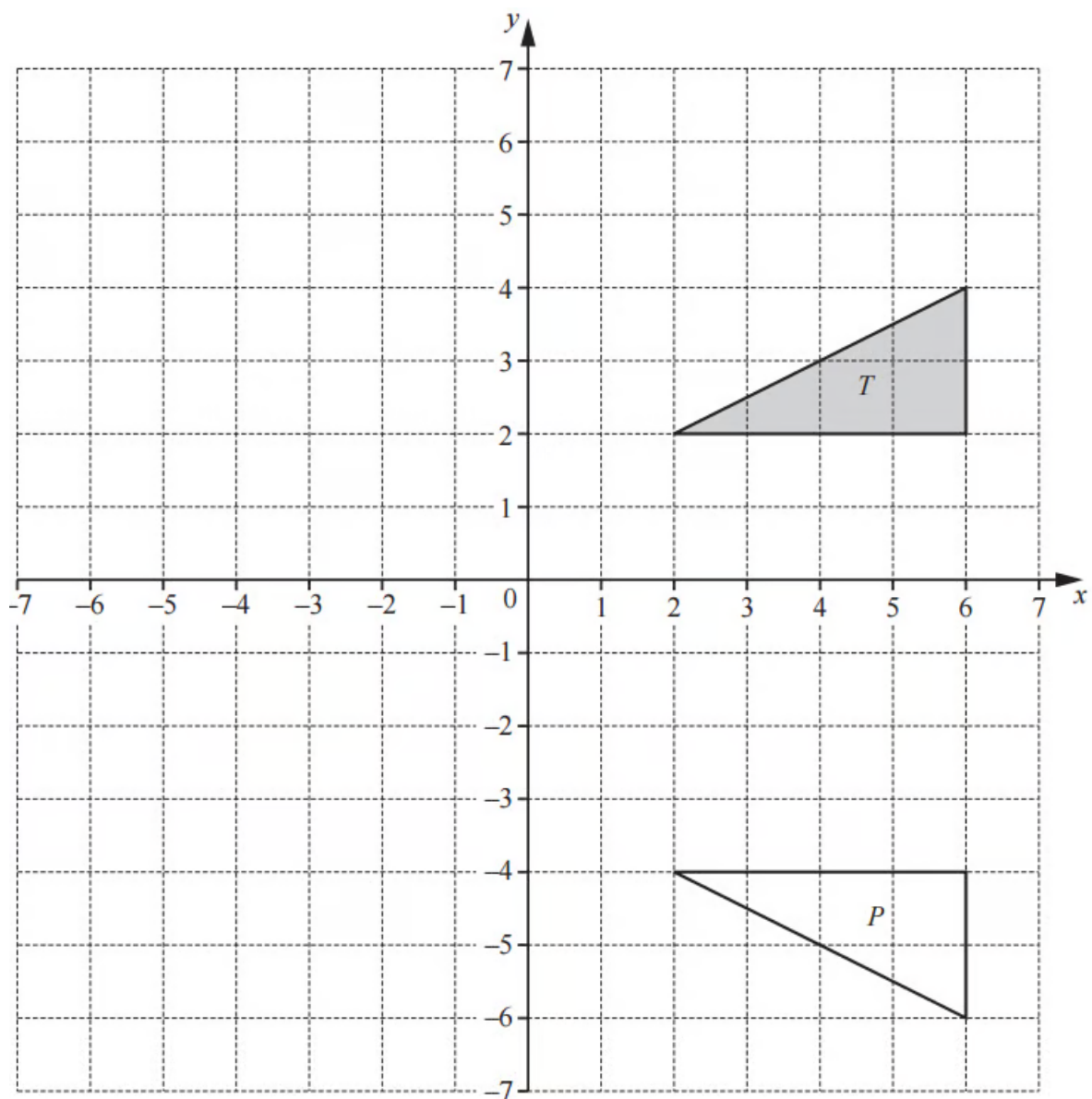
5



Describe fully the **single** transformation that maps flag A onto flag C,

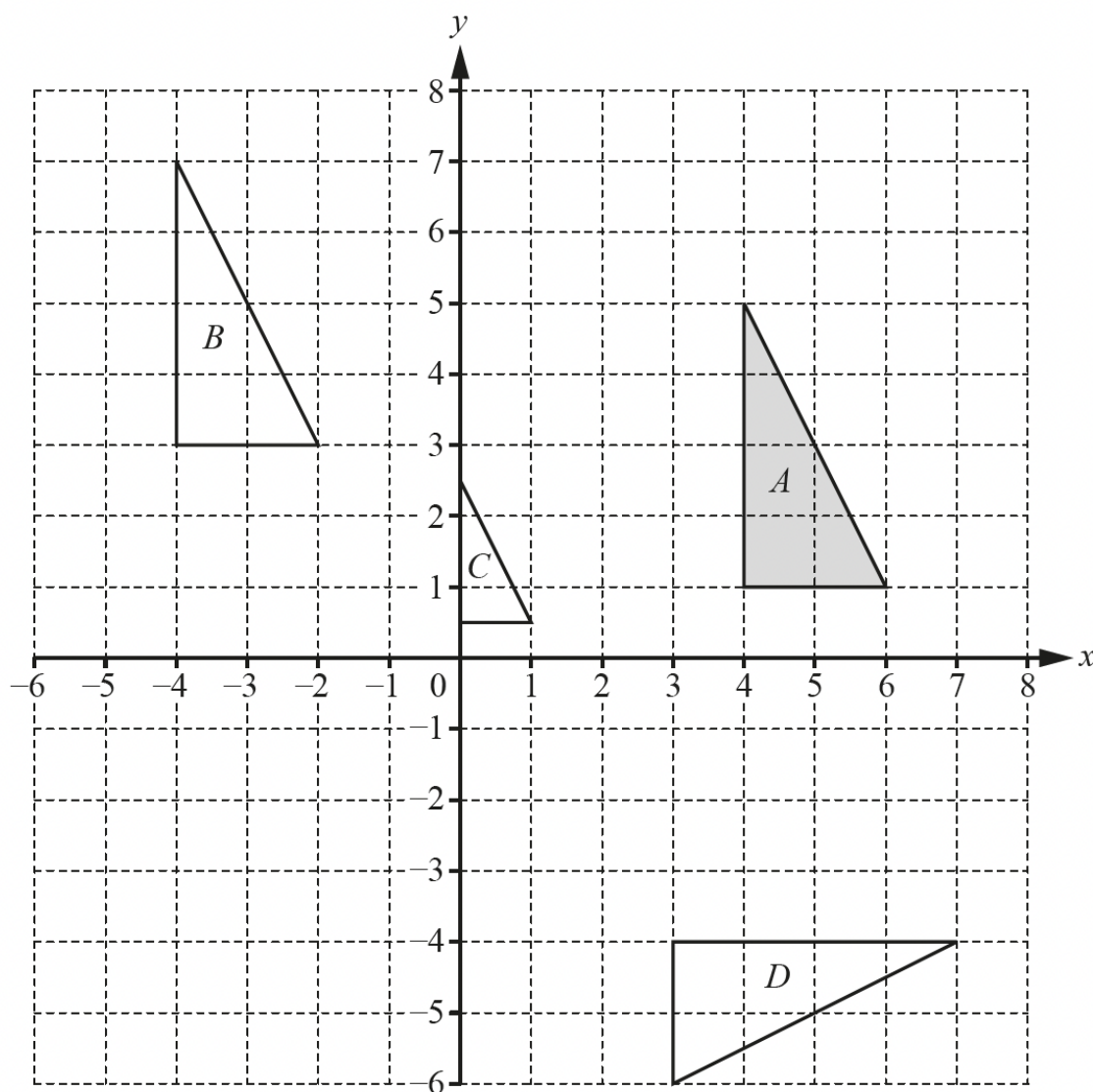
(3 marks)

6



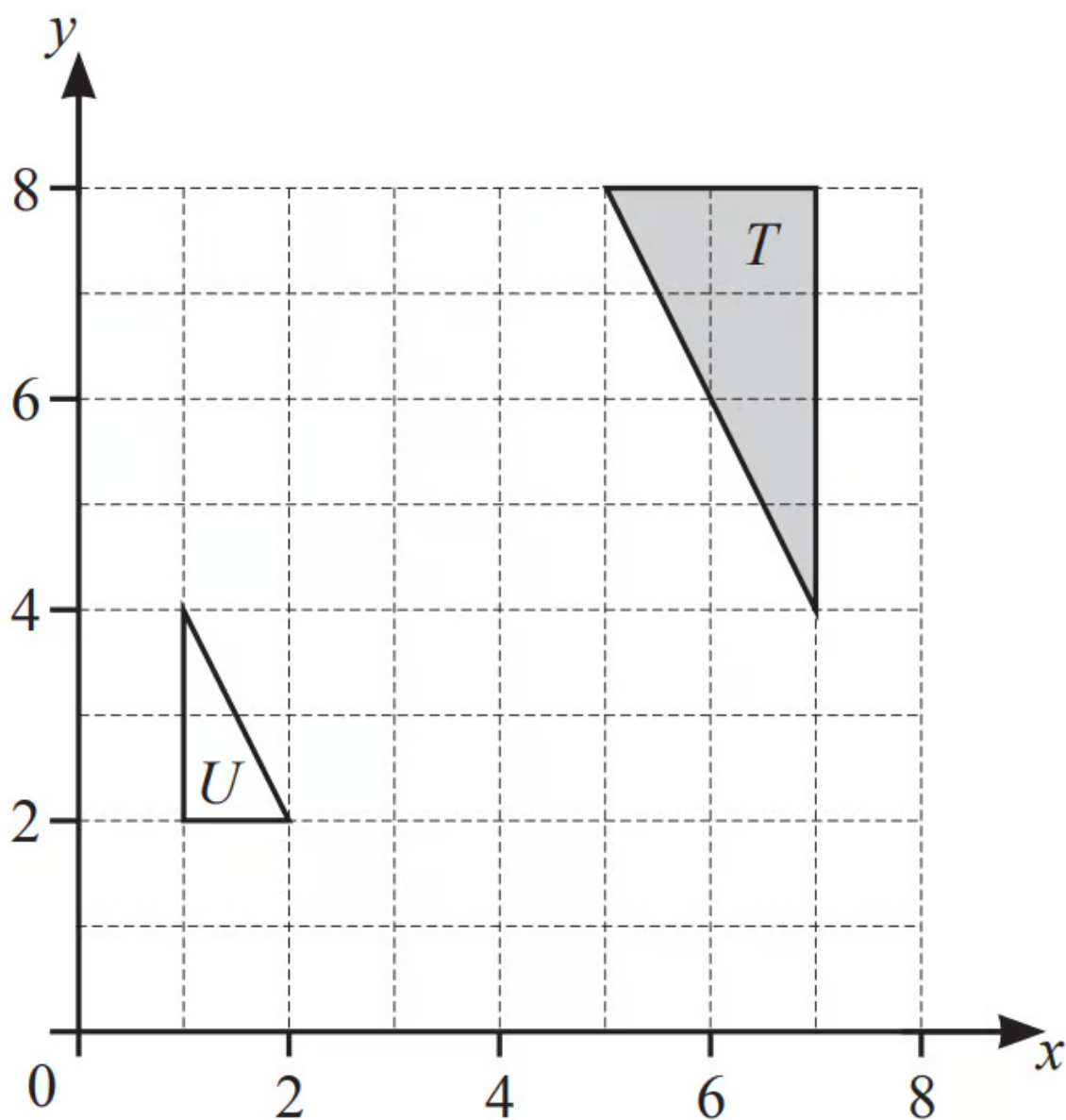
Enlarge triangle *T* by scale factor $-\frac{1}{2}$ with centre (0, 0).

(2 marks)



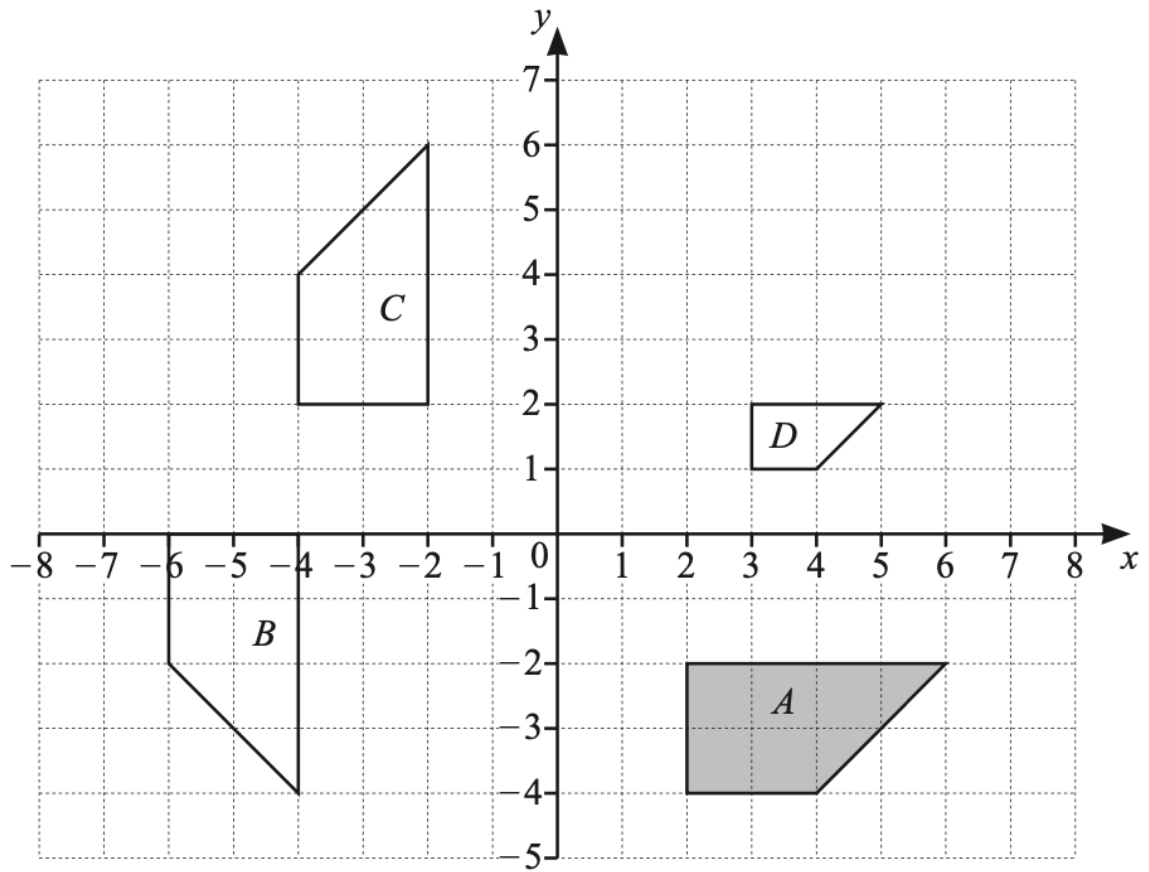
Describe fully the single transformation that maps triangle A onto triangle C.

(3 marks)



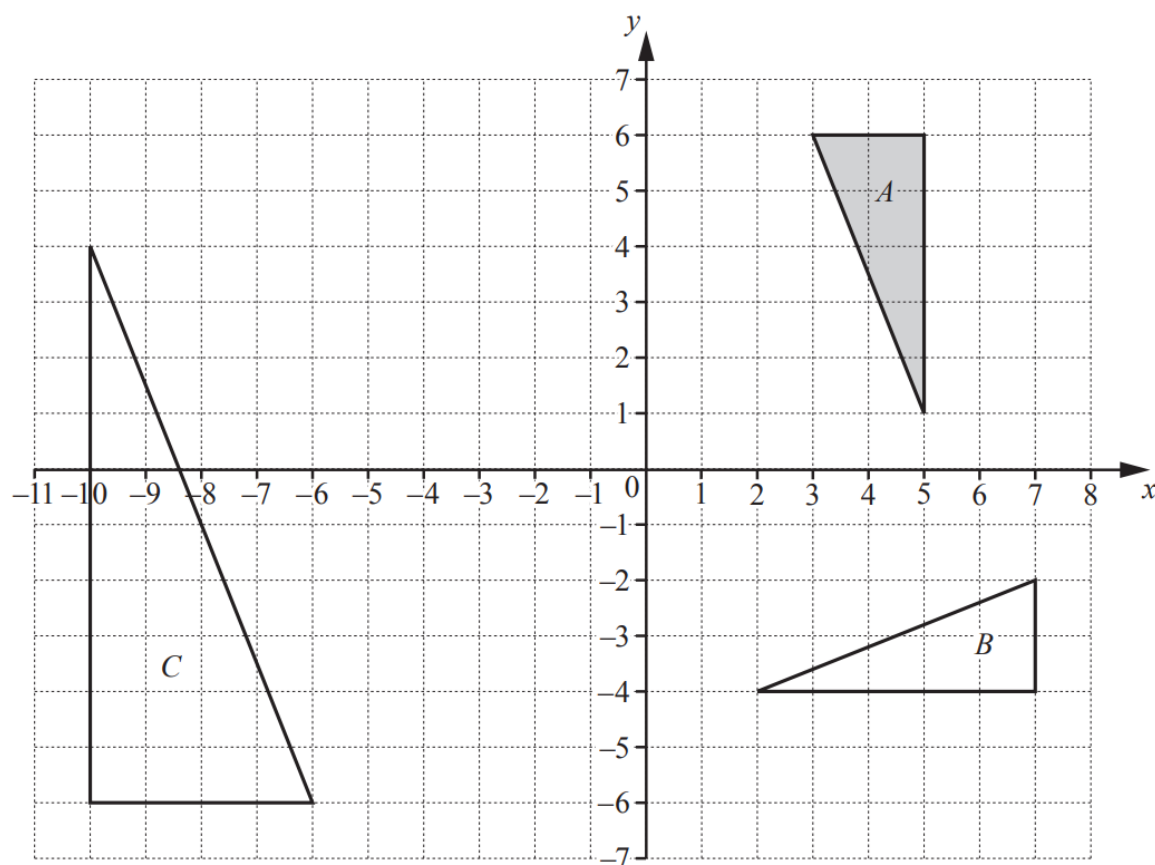
Describe fully the single transformation that maps triangle T onto triangle U .

(3 marks)



Describe fully the single transformation that maps shape A onto shape D.

(3 marks)



Describe fully the **single** transformation that maps triangle *A* onto triangle *C*.

(3 marks)