

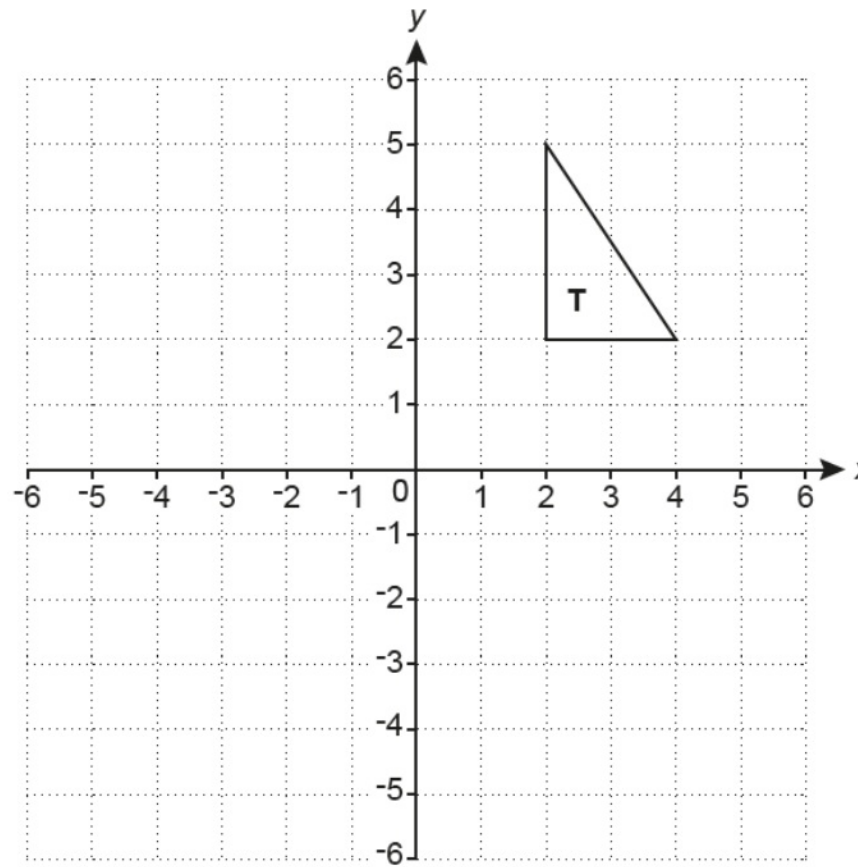
G38/39/40/41/42 Transformations

OCR

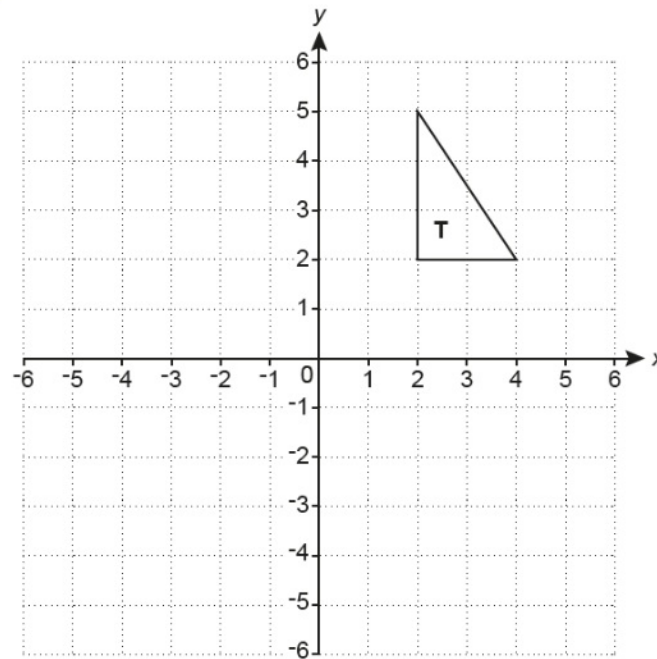
Video created by W Neill

11 Triangle **T** is drawn on a coordinate grid.

(a) Translate triangle **T** using the vector $\begin{pmatrix} -3 \\ 1 \end{pmatrix}$.



Video created by W Neill



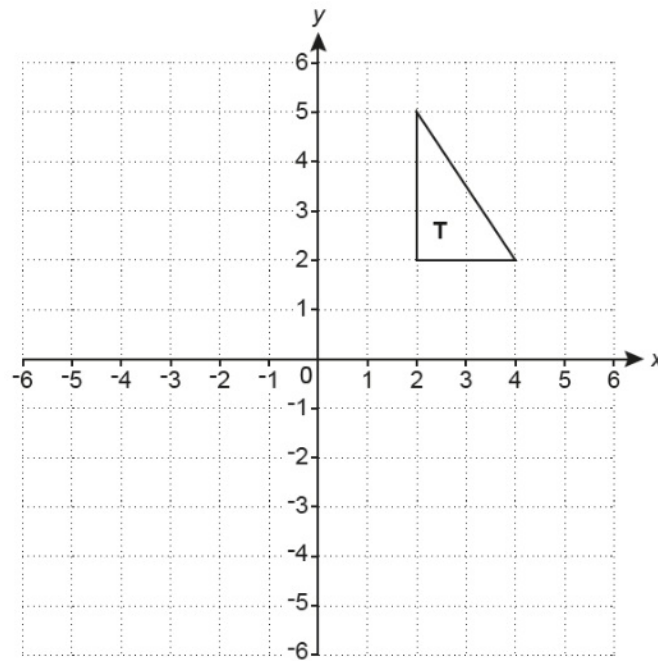
(b) Describe fully the **single** transformation that represents the following.

- (i) A rotation with centre $(0, 0)$ of 180° followed by a rotation with centre $(0, 0)$ of 90° clockwise.

.....

..... [2]

Video created by W Neill



(ii) A reflection in the x -axis followed by a reflection in the y -axis.

.....

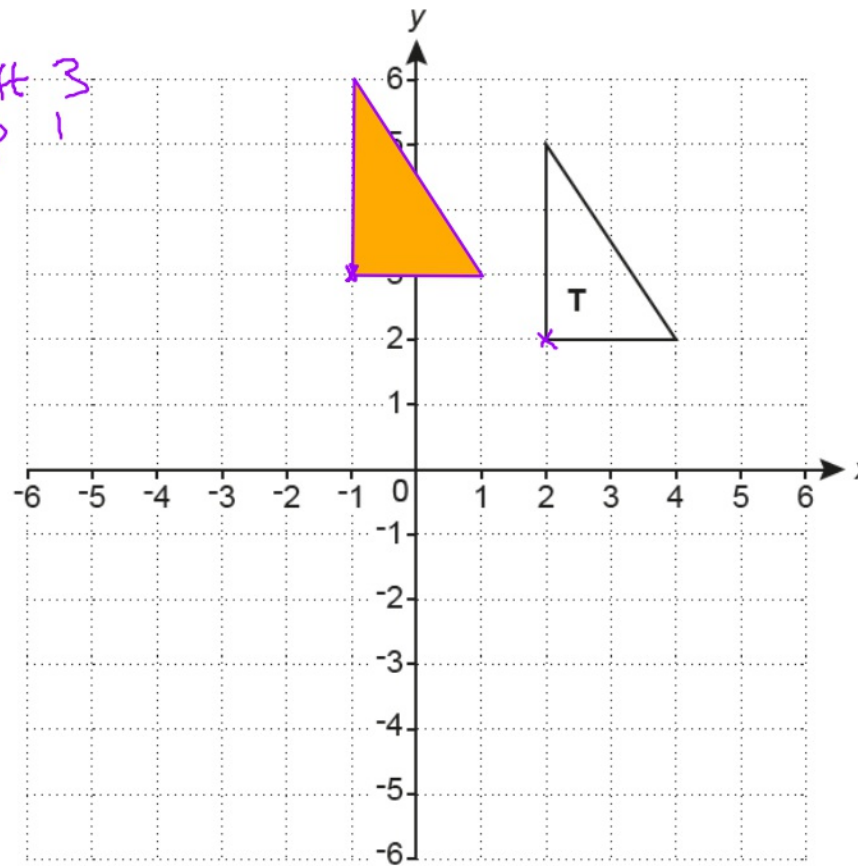
..... [3]

Video created by W Neill

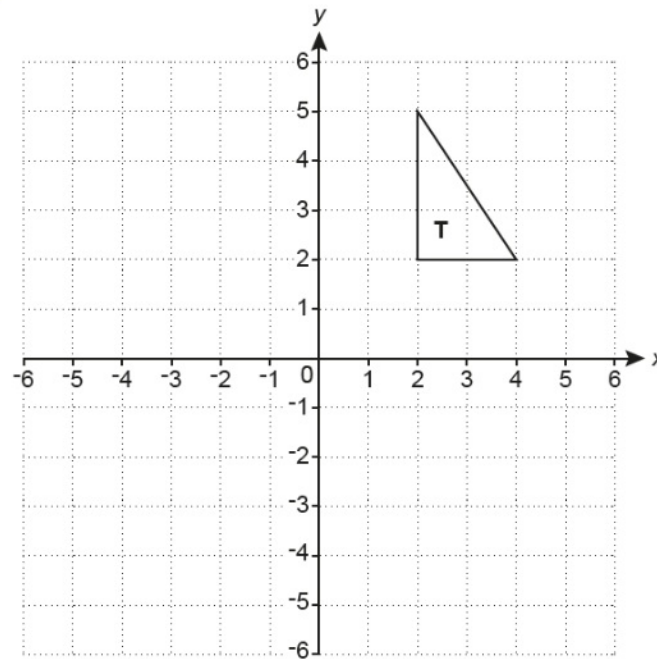
11 Triangle T is drawn on a coordinate grid.

(a) Translate triangle T using the vector $\begin{pmatrix} -3 \\ 1 \end{pmatrix}$. *left 3*
up 1

G38



Video created by W Neill



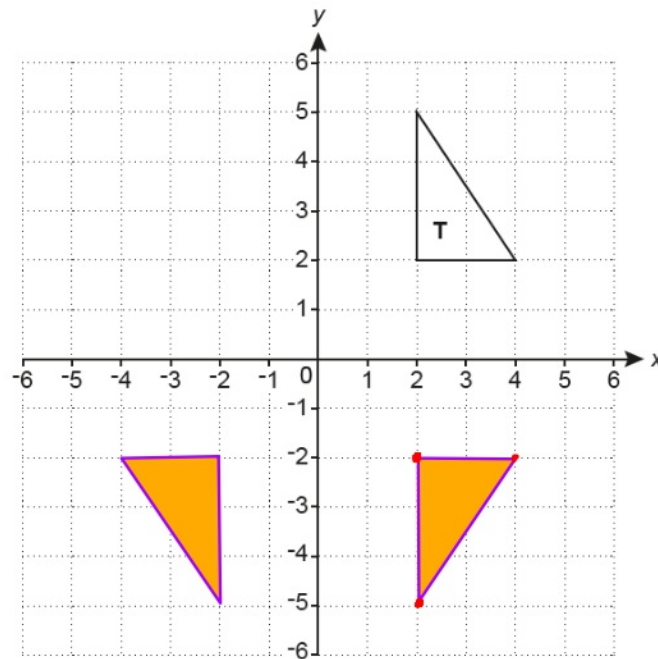
(b) Describe fully the **single** transformation that represents the following.

G40

- (i) A rotation with centre $(0, 0)$ of 180° followed by a rotation with centre $(0, 0)$ of 90° clockwise.

or Rotation $(0,0)$ cw 270°
or " " " " ccw 90° [2]

Video created by W Neill



(ii) A reflection in the x-axis followed by a reflection in the y-axis.

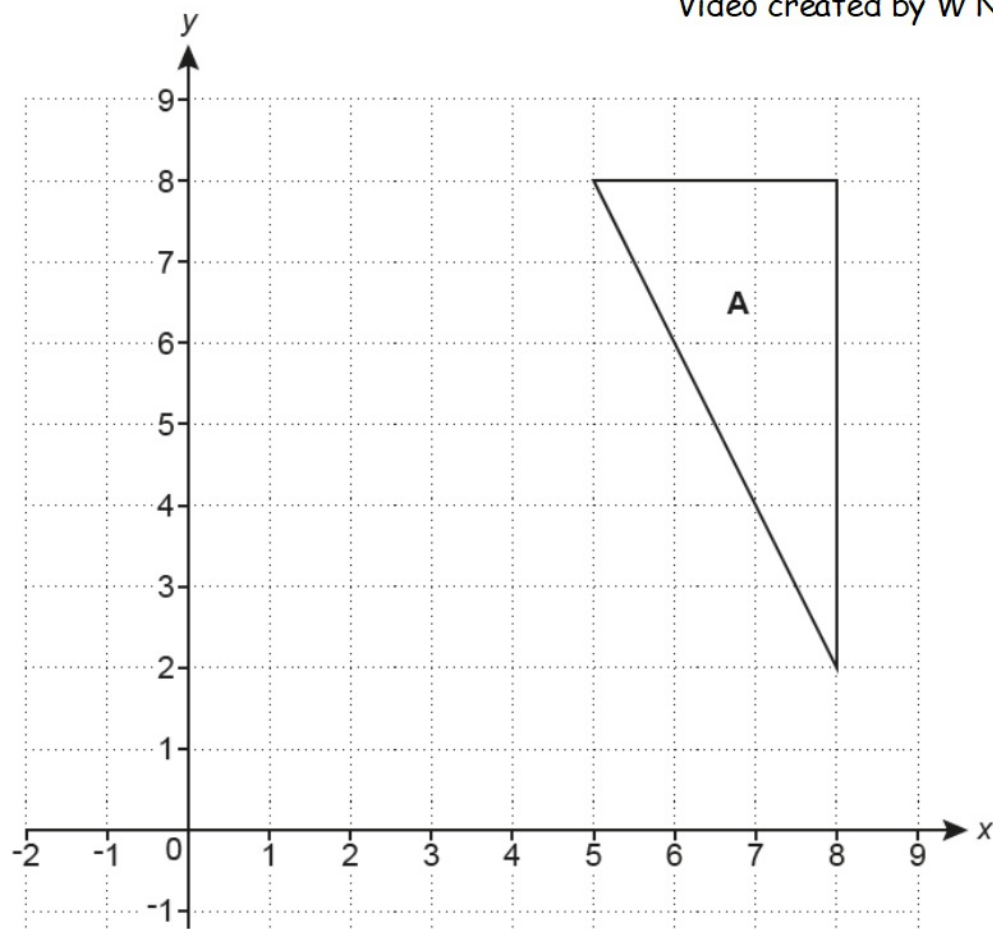
G39

Rotation $(0,0)$ 180°

[3]

9 (a) Triangle **A** is drawn on the grid.

Video created by W Neill



Enlarge triangle **A** with scale factor $\frac{1}{3}$ and centre of enlargement $(-1, 5)$.

[3]

9 (a) Triangle A is drawn on the grid.

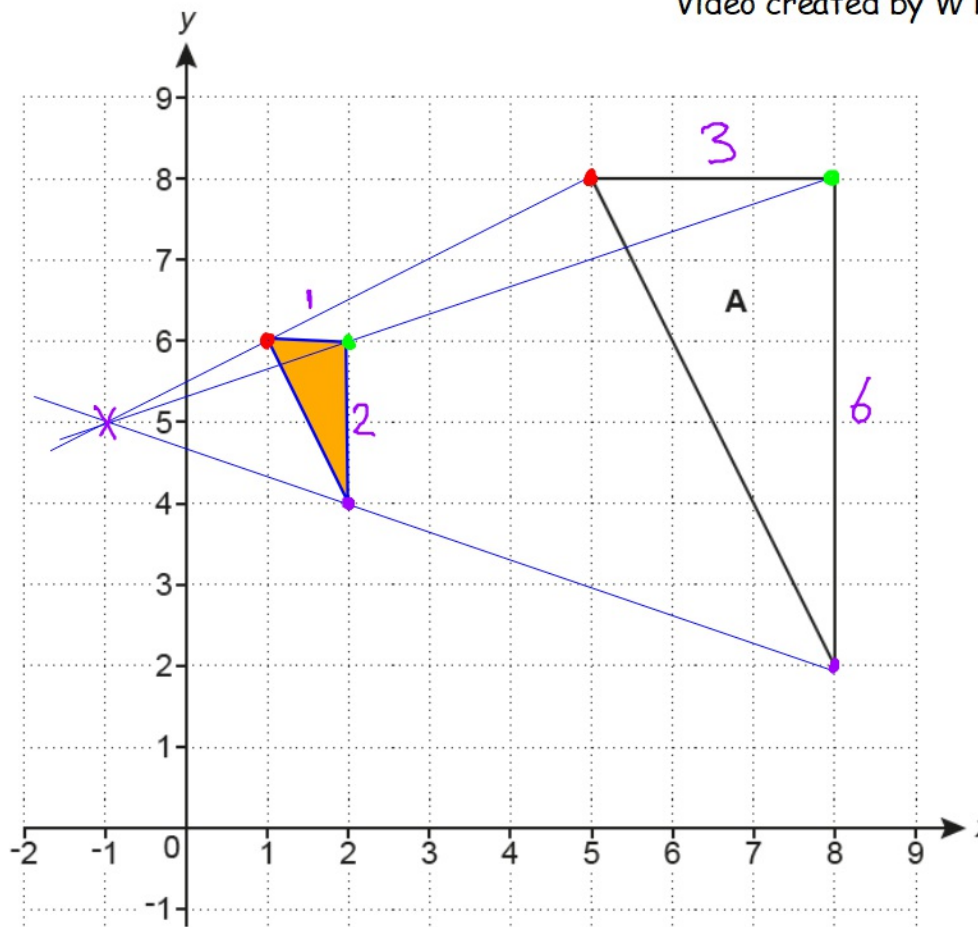
G41

Red → R U
 6 3
 $\frac{1}{3}$ 2 1

Green → R U
 9 3
 $\frac{1}{3}$ 3 1

Purple → R U
 9 3
 $\frac{1}{3}$ 3 1

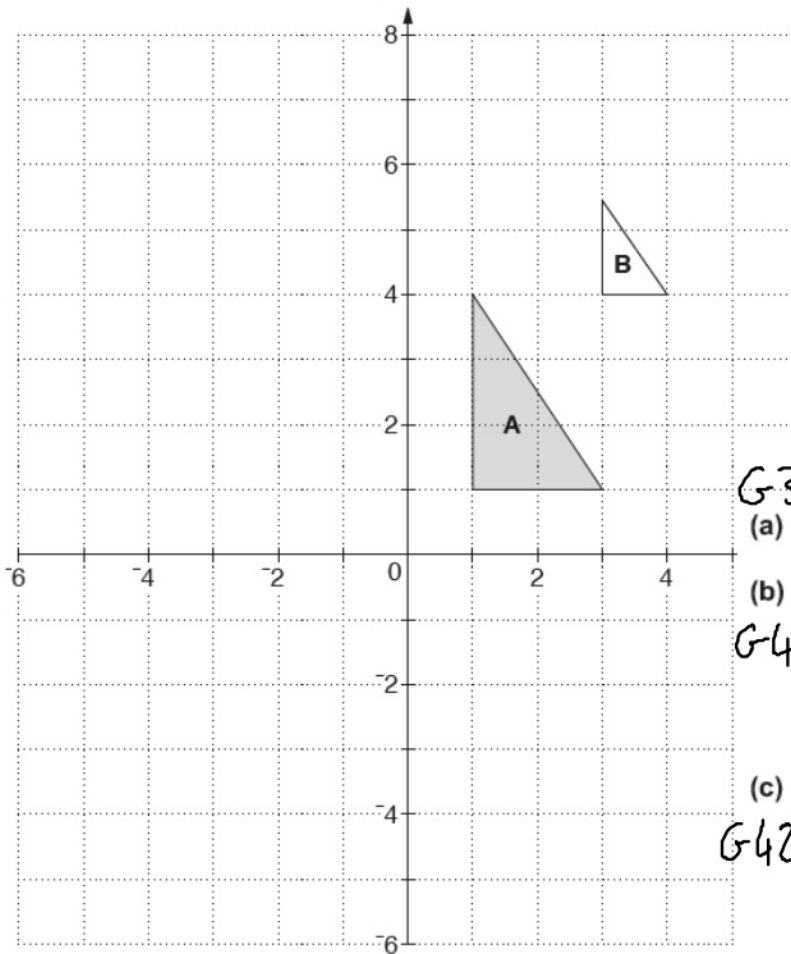
Video created by W Neill



Enlarge triangle A with scale factor $\frac{1}{3}$ and centre of enlargement (-1, 5).

[3]

5 Here is a coordinate grid.



G39

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

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

G41

.....
.....

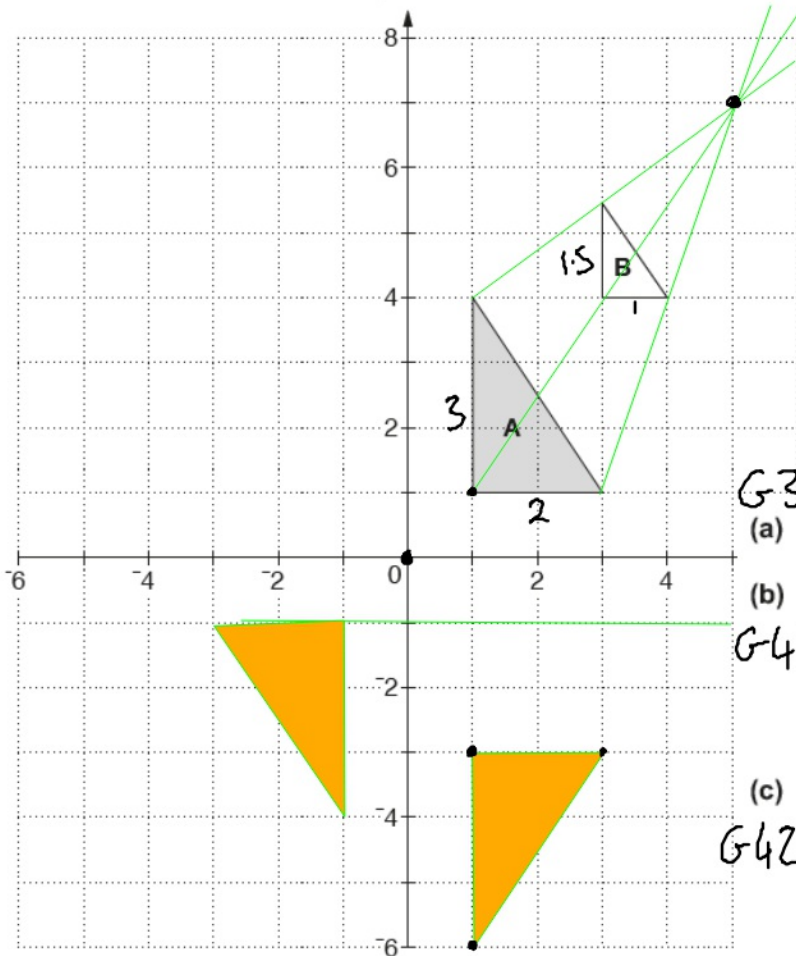
(c) Complete this statement.

G42

A rotation of 180° around $(0, 0)$ has the same effect as an enlargement by scale factor with centre of enlargement (.....,

5 Here is a coordinate grid.

Created by W Neill



G39

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

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

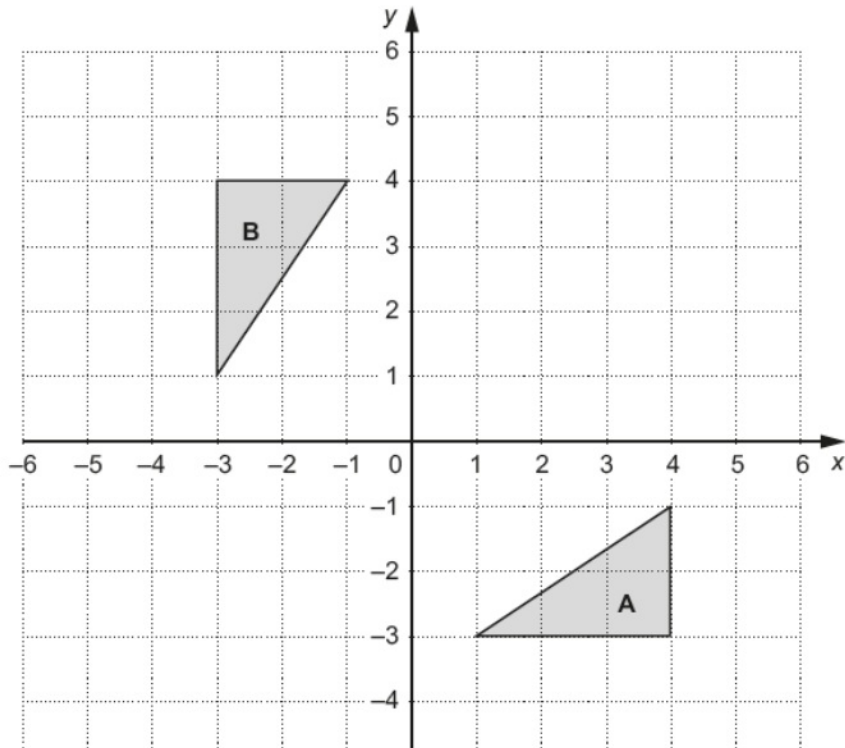
G41 Enlargement by SF 0.5, centre (5, 7)

(c) Complete this statement.

G42 A rotation of 180° around (0, 0) has the same effect as an enlargement by scale factor -1 with centre of enlargement (0, 0).

6 Triangles **A** and **B** are drawn on a coordinate grid.

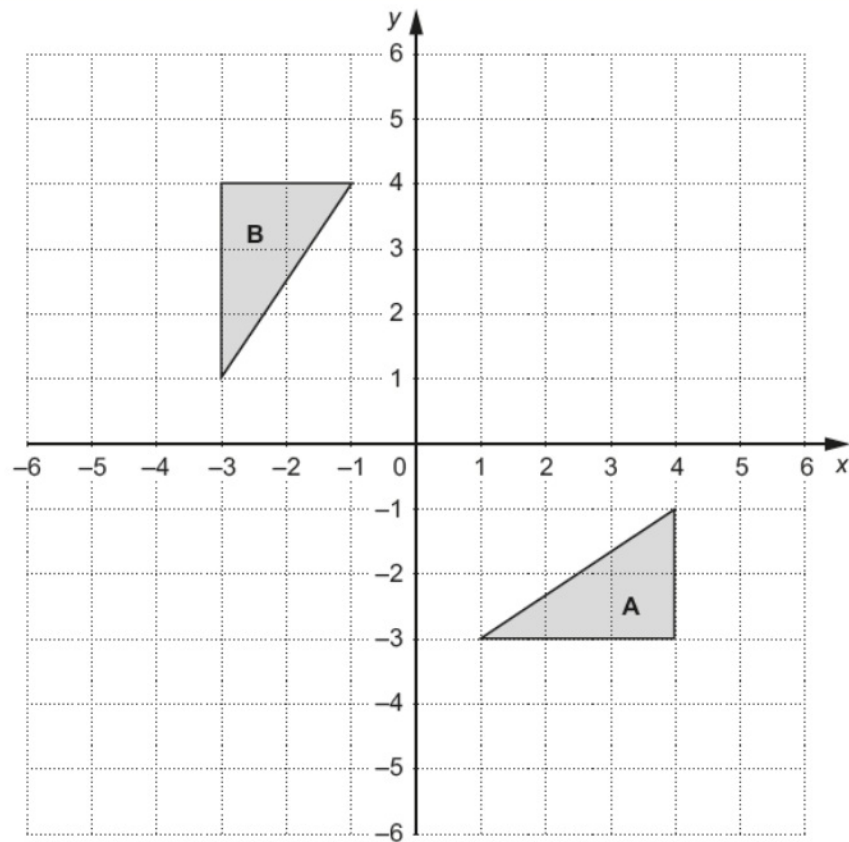
Created by W Neill



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

.....
..... [2]

Created by W Neill



(b) Triangle **A** can also be mapped onto triangle **B** using a combination of two transformations:

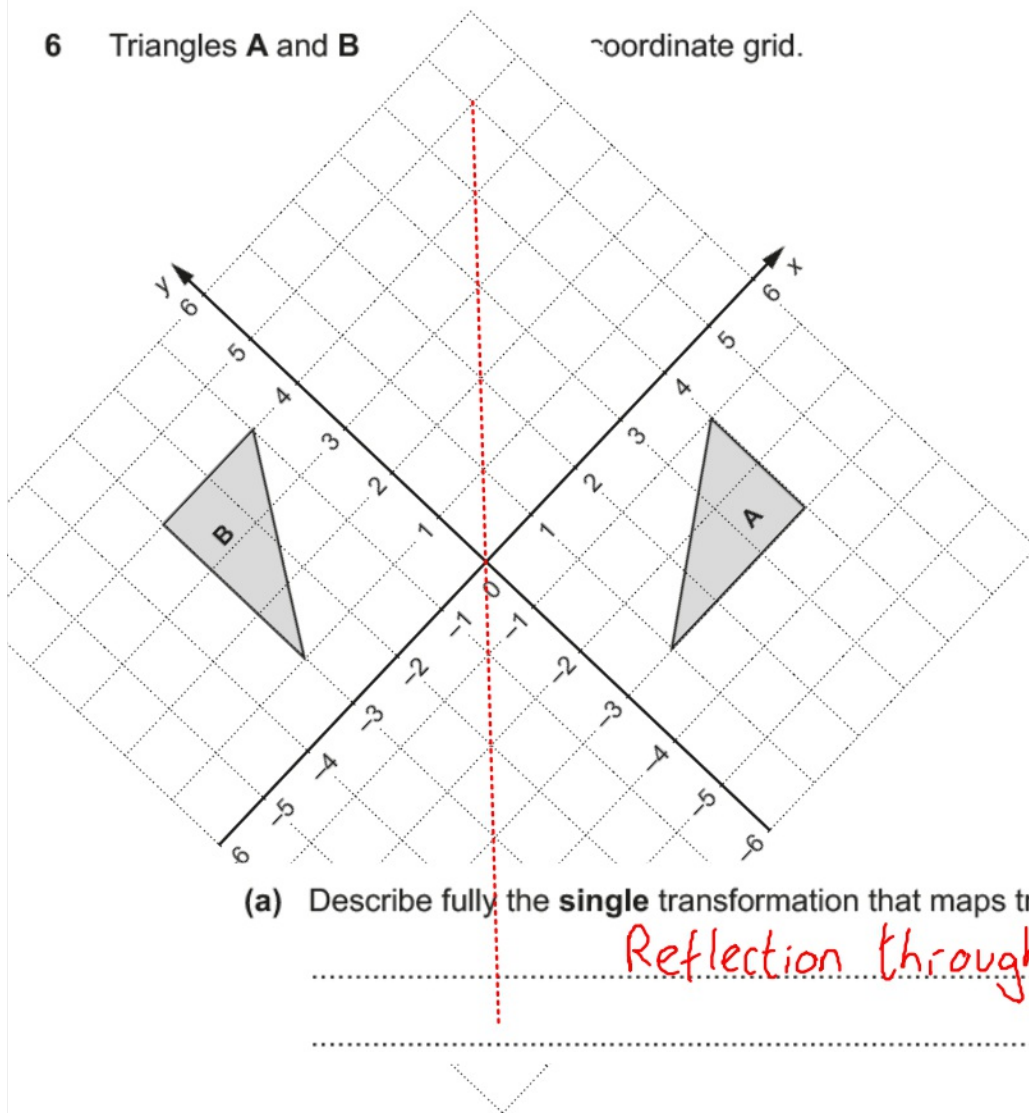
- a transformation **T**, followed by
- a reflection in the line $x = 0$.

Describe fully transformation **T**.

6 Triangles A and B

coordinate grid.

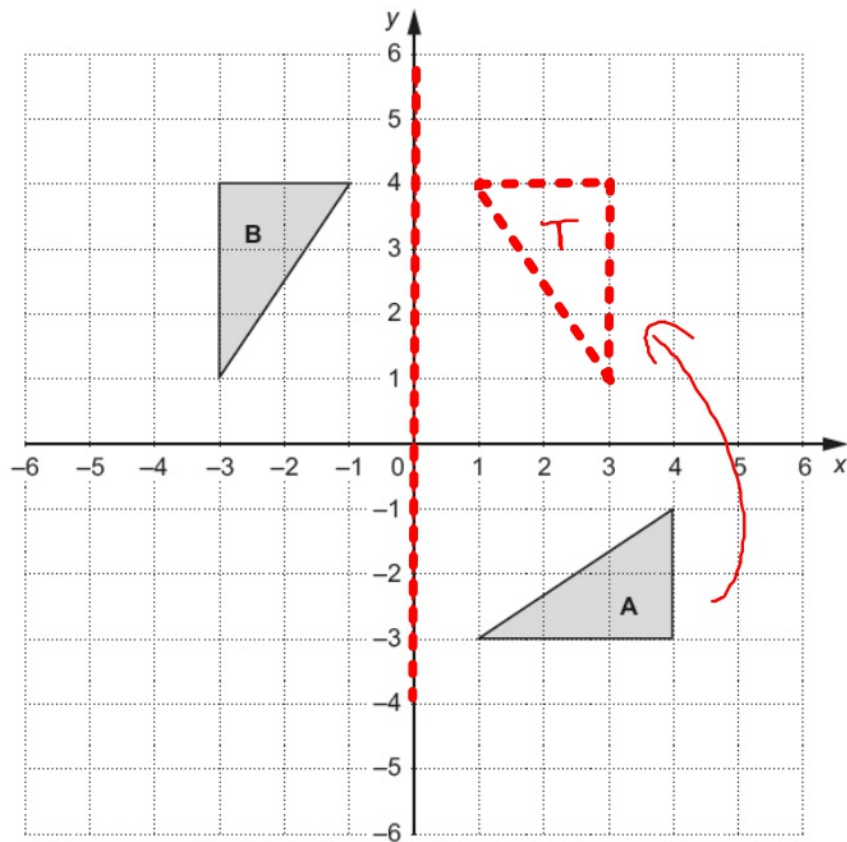
Created by W Neill



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

Reflection through the line $y=x$

[2]



Created by W Neill

Rotation
 90° anti-clockwise

(b) Triangle **A** can also be mapped onto triangle **B** using a combination of two transformations:

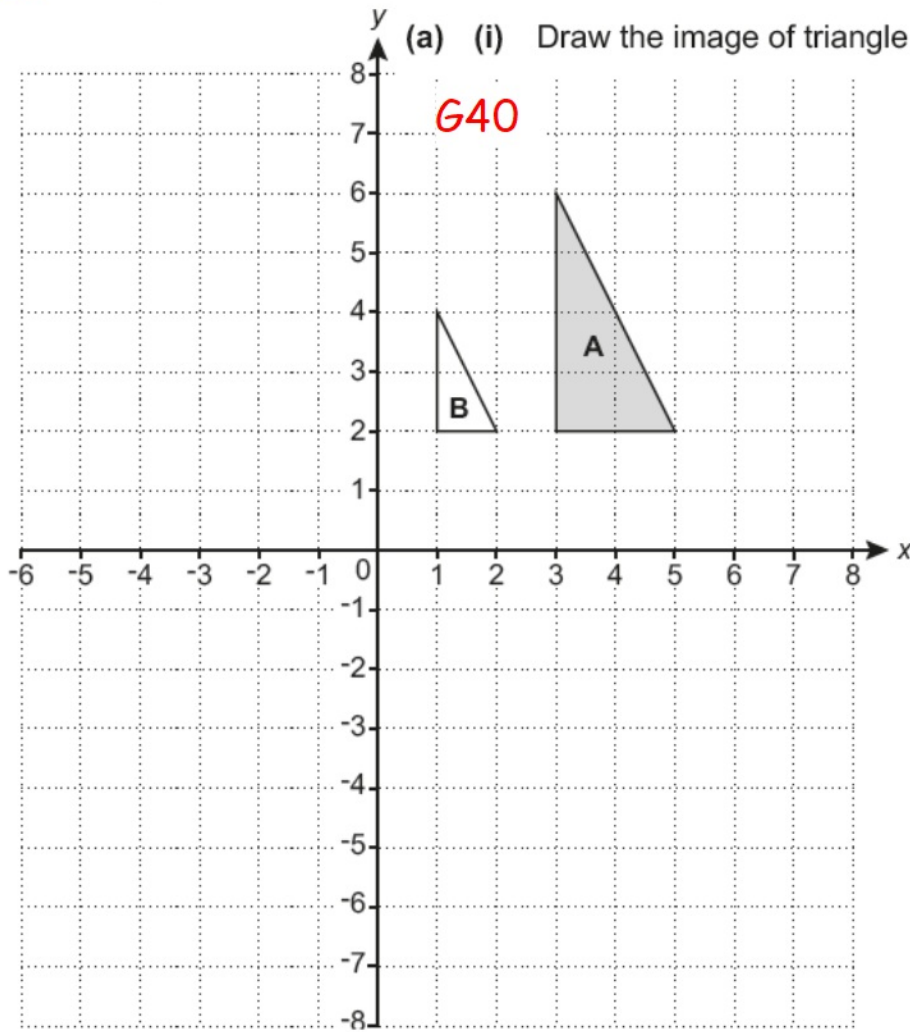
- a transformation **T**, followed by
- a reflection in the line $x = 0$.

Describe fully transformation **T**.

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

(a) (i) Draw the image of triangle **A** after a rotation of 180° about $(0, 0)$.

[2]

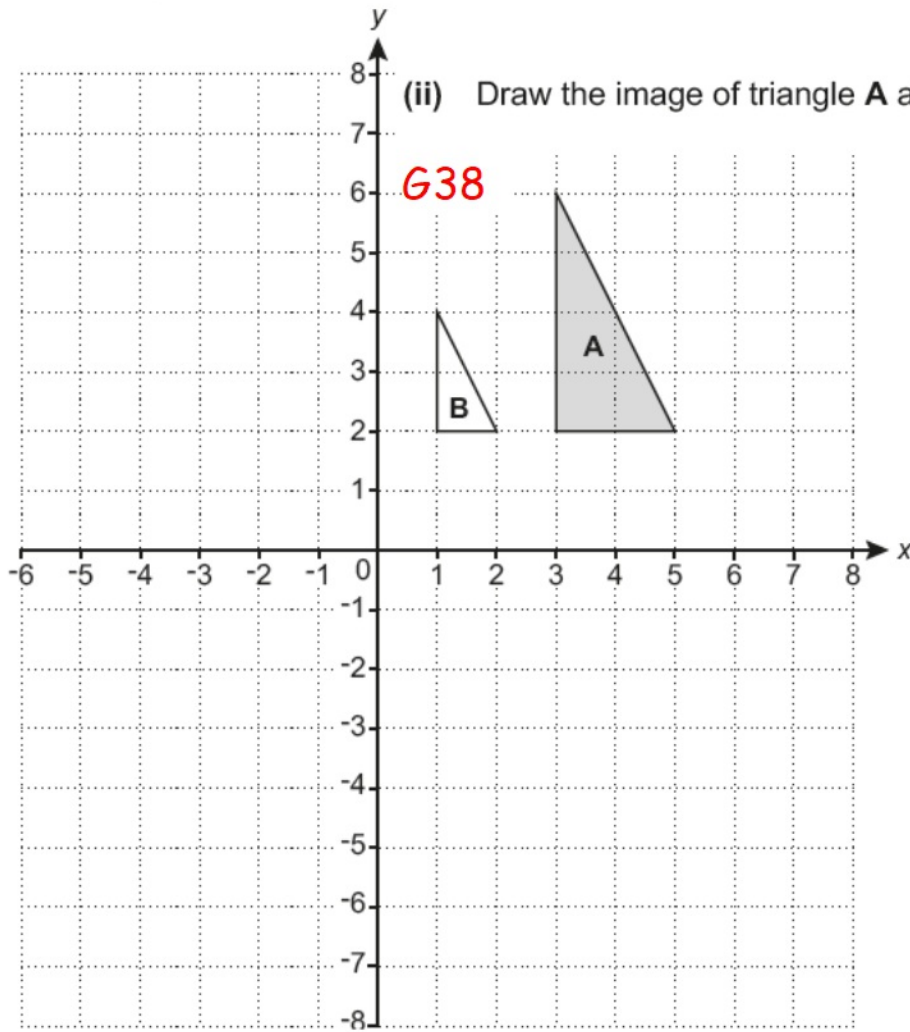


Triangle **A** and triangle **B** are drawn on the coordinate grid.

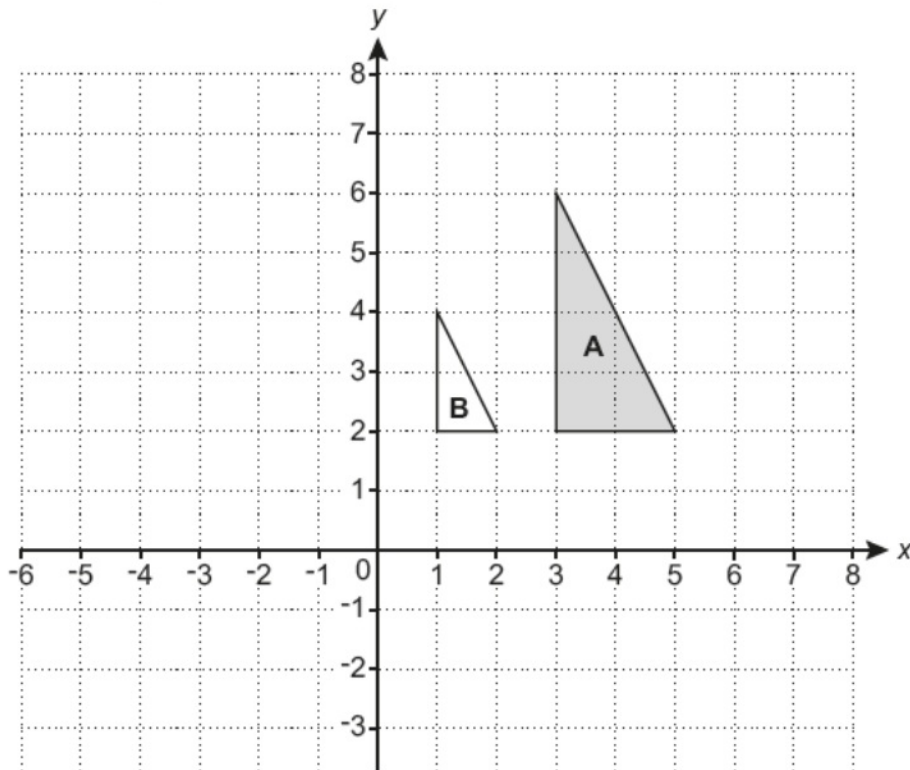
(ii) Draw the image of triangle **A** after a translation by the vector $\begin{pmatrix} 2 \\ -7 \end{pmatrix}$.

[2]

G38



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



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

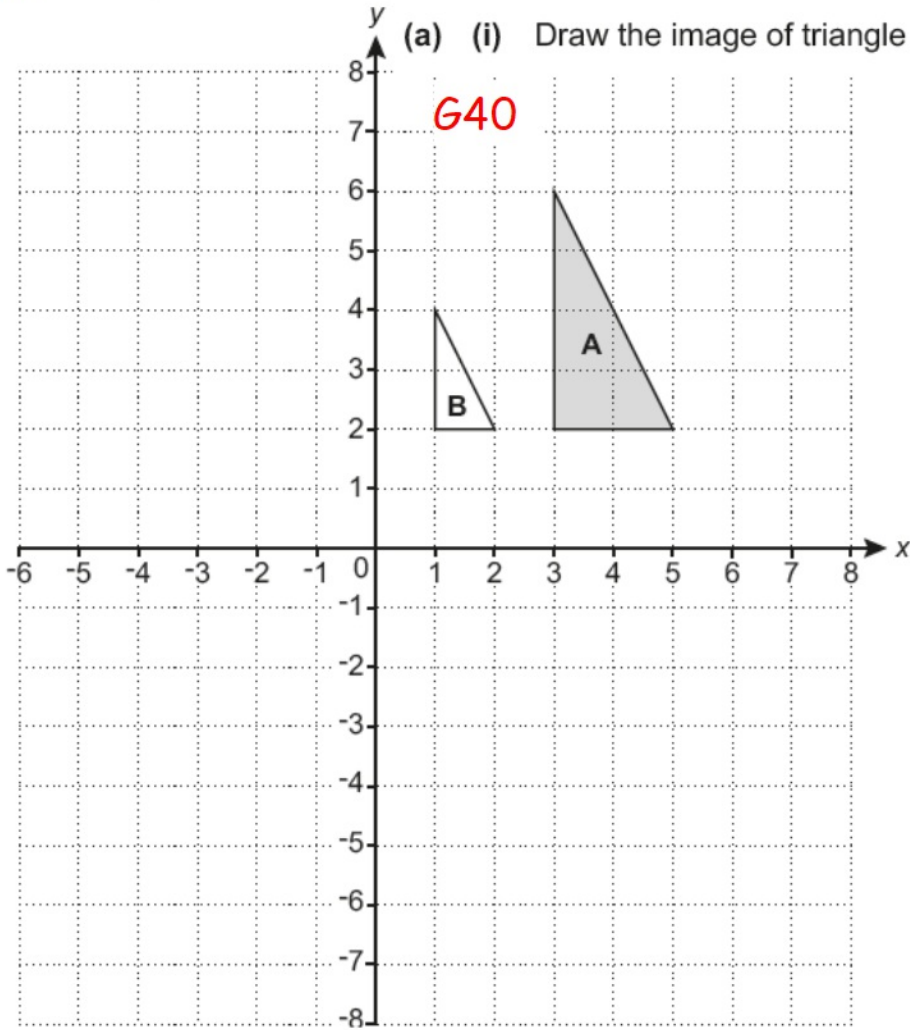
G41

..... [3]

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

(a) (i) Draw the image of triangle **A** after a rotation of 180° about $(0, 0)$.

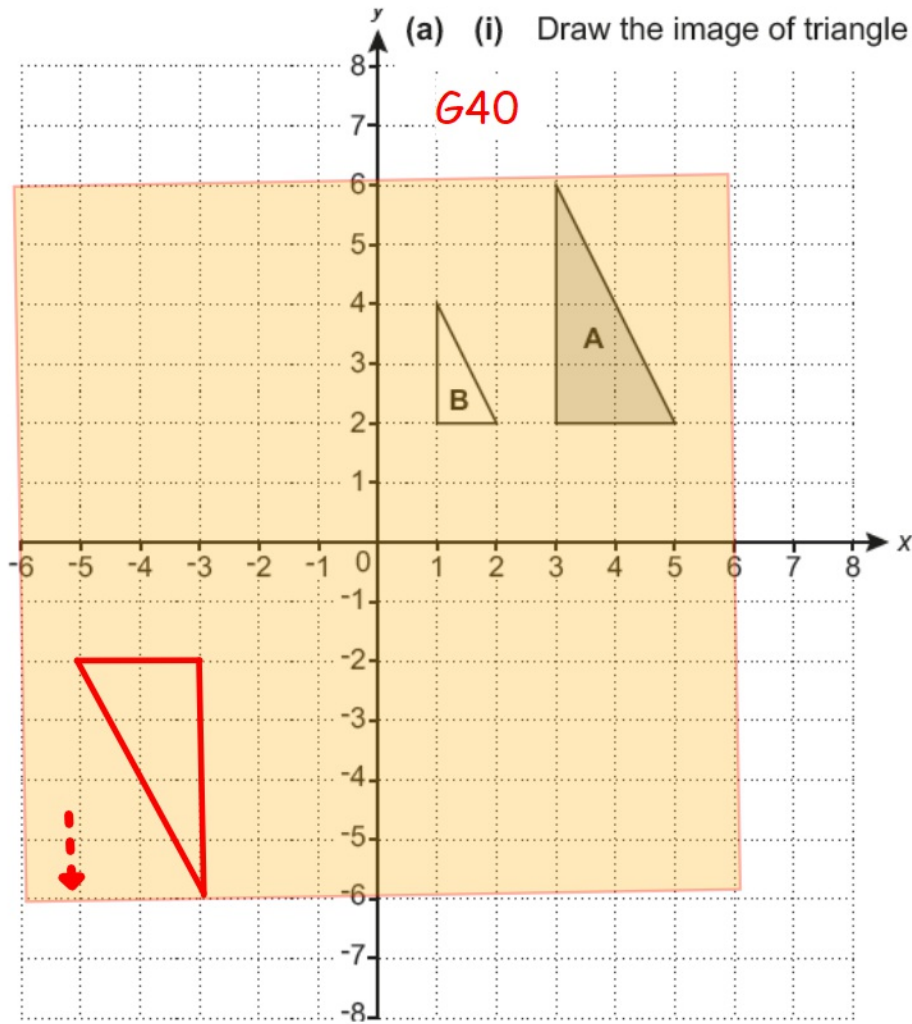
[2]



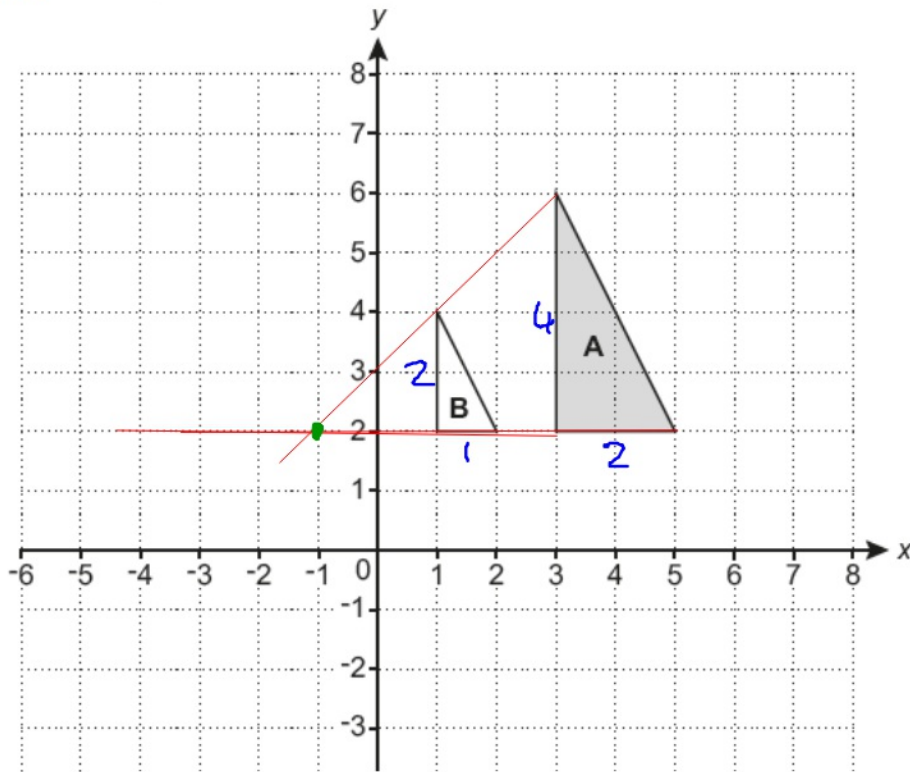
10 Triangle **A** and triangle **B** are drawn on the coordinate grid.

(a) (i) Draw the image of triangle **A** after a rotation of 180° about $(0, 0)$.

[2]



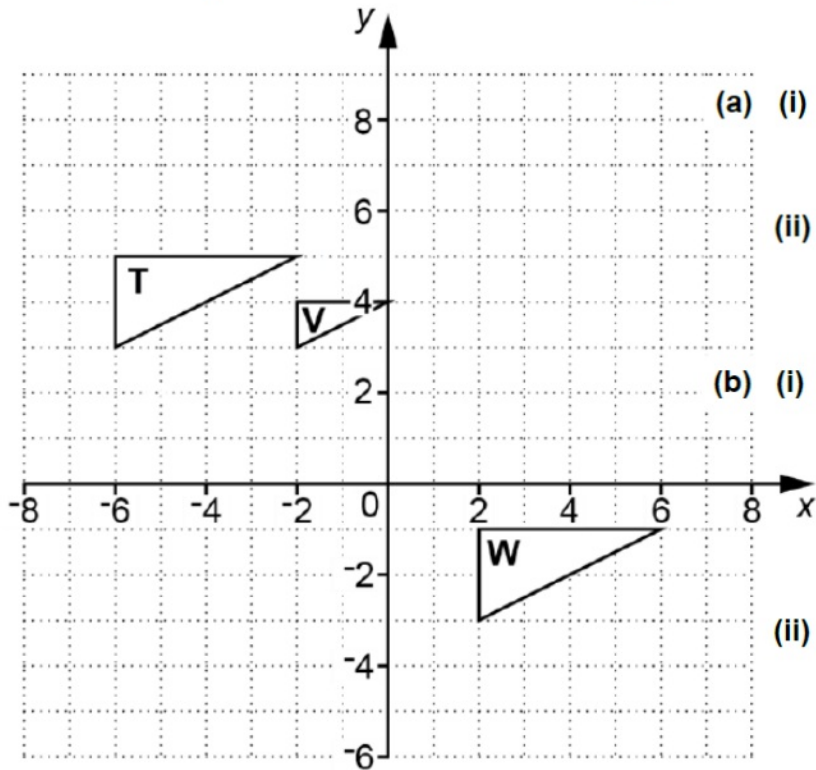
10 Triangle A and triangle B are drawn on the coordinate grid.



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

G41 enlargement by Sf $\frac{1}{2}$ with centre of
 enlargement $(-1, 2)$ [3]

17 Three triangles are drawn on a coordinate grid.



(a) (i) Draw the image of triangle T after a reflection in the line $y = 0$.

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

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

(ii) Describe fully the **single** transformation that maps triangle T onto triangle V.

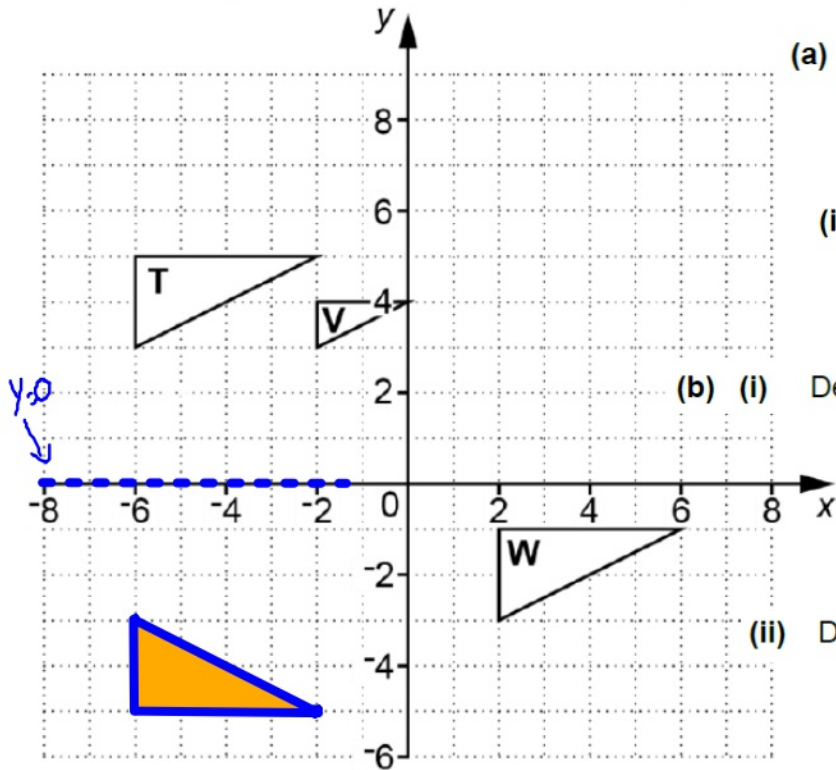
(c) Heather says

Any transformation always produces a shape that is congruent to the original shape.

Is her statement correct? Explain your reasoning.

..... [1]

17 Three triangles are drawn on a coordinate grid.



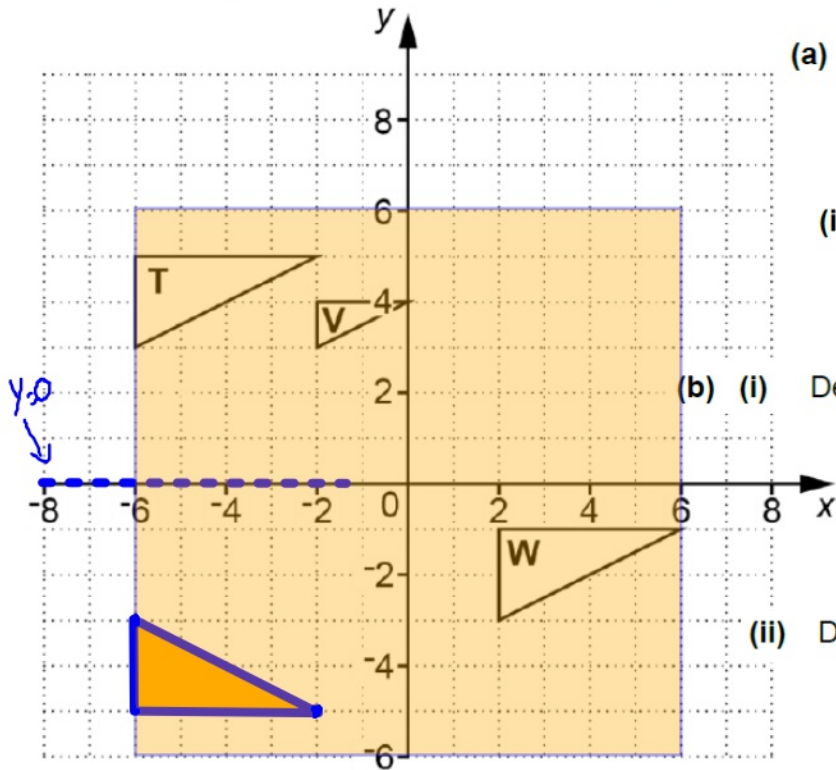
(a) (i) Draw the image of triangle **T** after a reflection in the line $y = 0$.

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

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

(ii) Describe fully the **single** transformation that maps triangle **T** onto triangle **V**.

17 Three triangles are drawn on a coordinate grid.



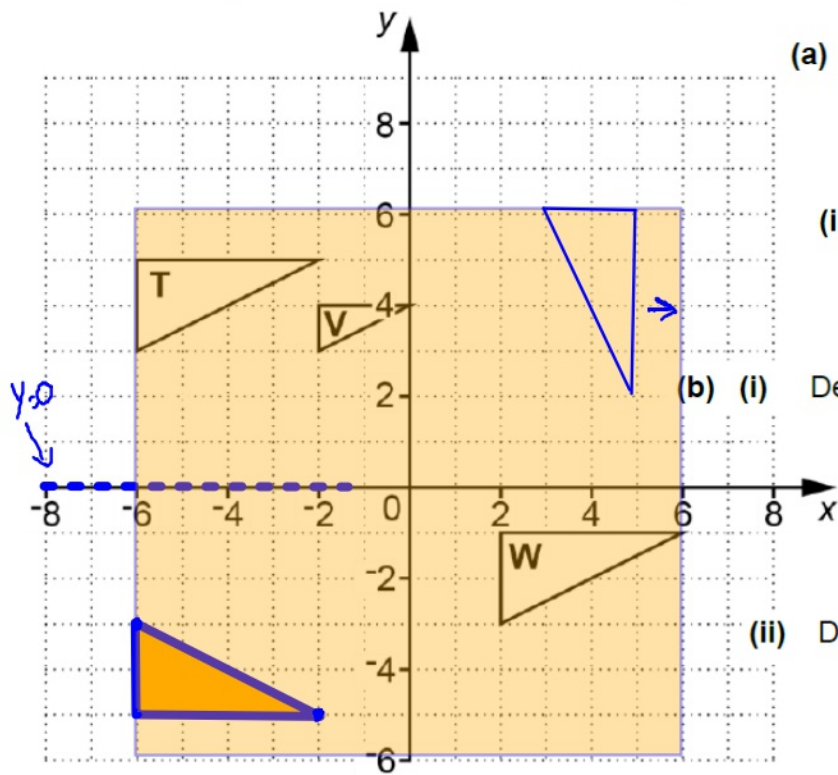
(a) (i) Draw the image of triangle **T** after a reflection in the line $y = 0$.

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

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

(ii) Describe fully the **single** transformation that maps triangle **T** onto triangle **V**.

17 Three triangles are drawn on a coordinate grid.



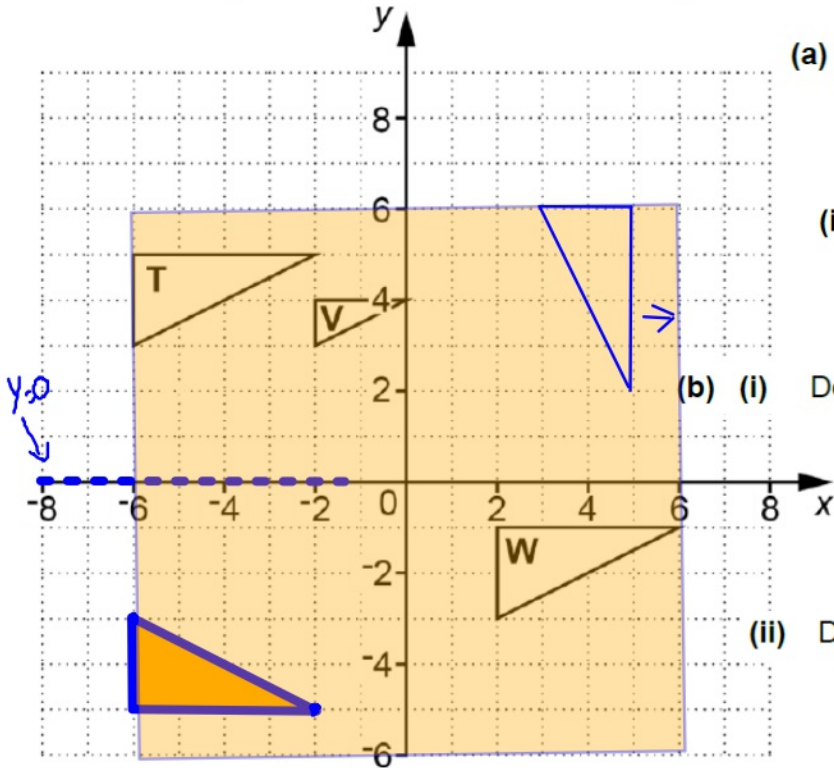
(a) (i) Draw the image of triangle **T** after a reflection in the line $y = 0$.

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

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

(ii) Describe fully the **single** transformation that maps triangle **T** onto triangle **V**.

17 Three triangles are drawn on a coordinate grid.



(a) (i) Draw the image of triangle **T** after a reflection in the line $y = 0$.

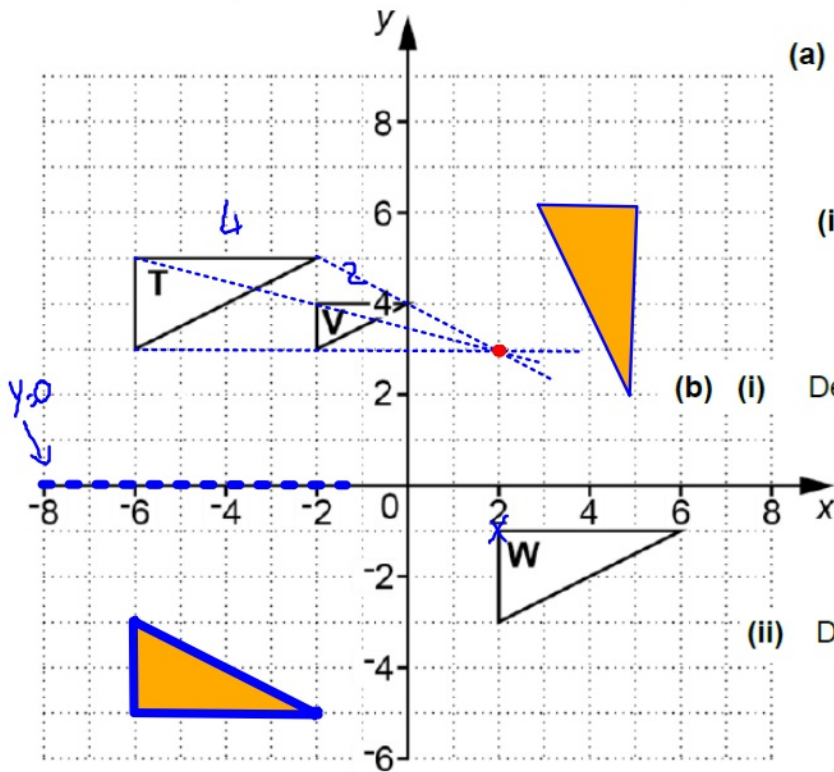
(ii) Draw the image of triangle **T** after a rotation 90° clockwise about $(0, 0)$.

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

(ii) Describe fully the **single** transformation that maps triangle **T** onto triangle **V**.

17 Three triangles are drawn on a coordinate grid.

Created by W Neill



(a) (i) Draw the image of triangle T after a reflection in the line $y = 0$.

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

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

Translation $\begin{pmatrix} 8 \\ -6 \end{pmatrix}$ $\begin{matrix} + & - \\ R/L & \\ + & - \\ U/D & \end{matrix}$

(ii) Describe fully the **single** transformation that maps triangle T onto triangle V.

Enlargement by SF $\frac{1}{2}$ from
centre $(2, 3)$

(c) Heather says

→ identical

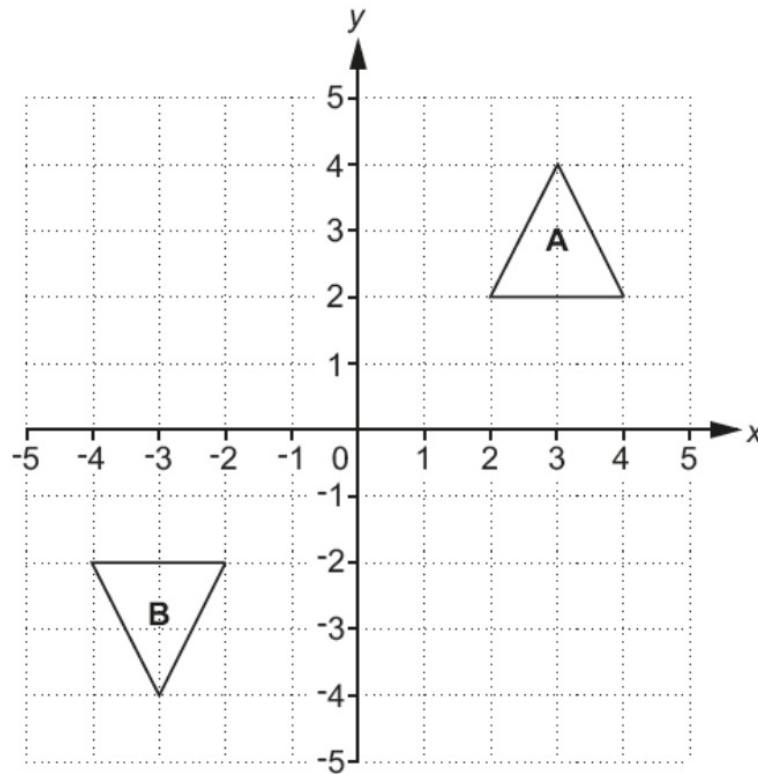
Any transformation always produces a shape that is congruent to the original shape.

Is her statement correct? Explain your reasoning.

..... No, Enlargement changes the size of the shape [1]

8 The diagram shows two triangles on a square grid.

Created by W Neill



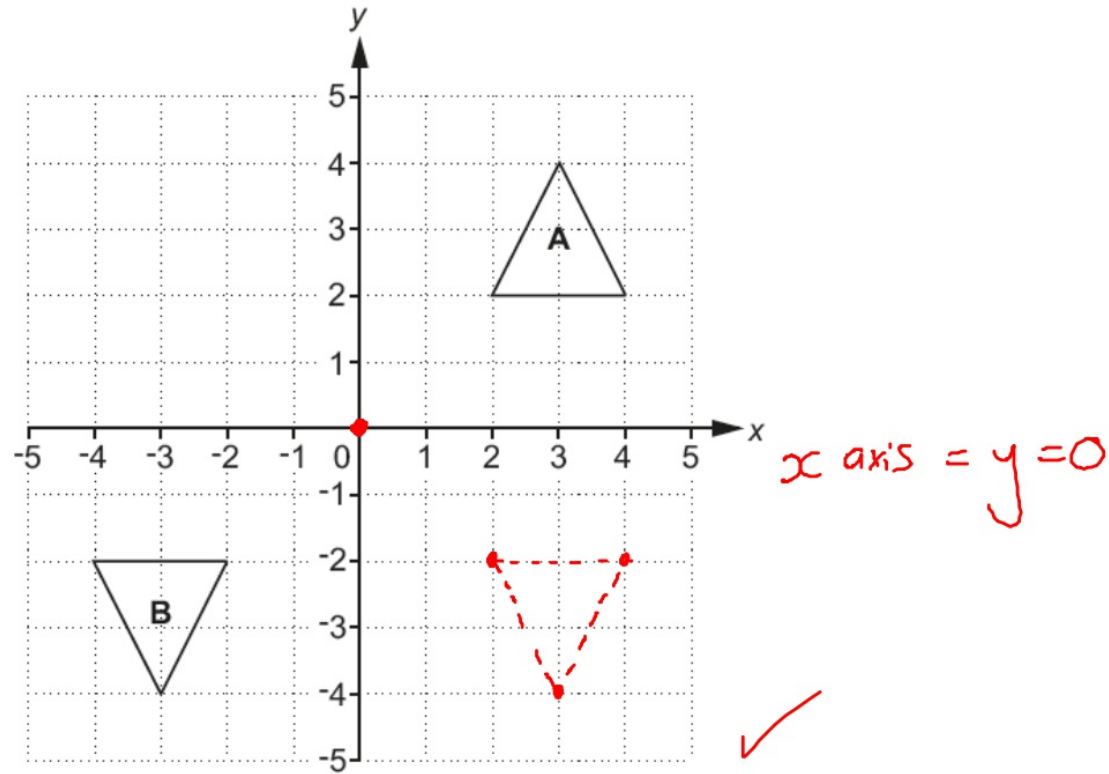
(a) Reflect triangle **A** in the line $y = 0$. [2]

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

.....
..... [3]

8 The diagram shows two triangles on a square grid.

Created by W Neill



(a) Reflect triangle **A** in the line $y = 0$.

[2]

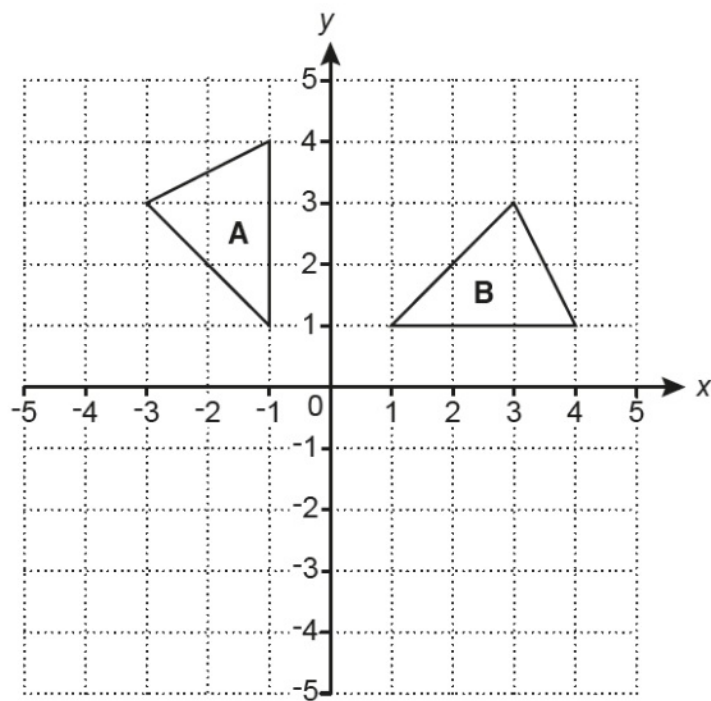
(b) Describe fully the **single** transformation that maps triangle **A** onto triangle **B**.

Rotation 180° centre of rotation (0,0)

[3]

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

Video created by W Neill



(a) Translate triangle **A** by vector $\begin{pmatrix} 3 \\ -5 \end{pmatrix}$. [2]

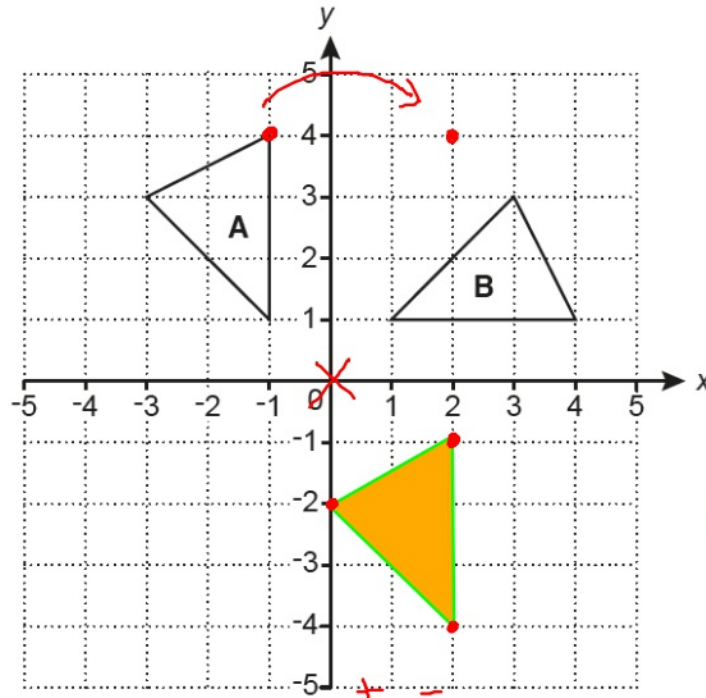
(b) Describe fully the **single** transformation that maps triangle **A** onto triangle **B**.

.....

..... [3]

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

Video created by W Neill



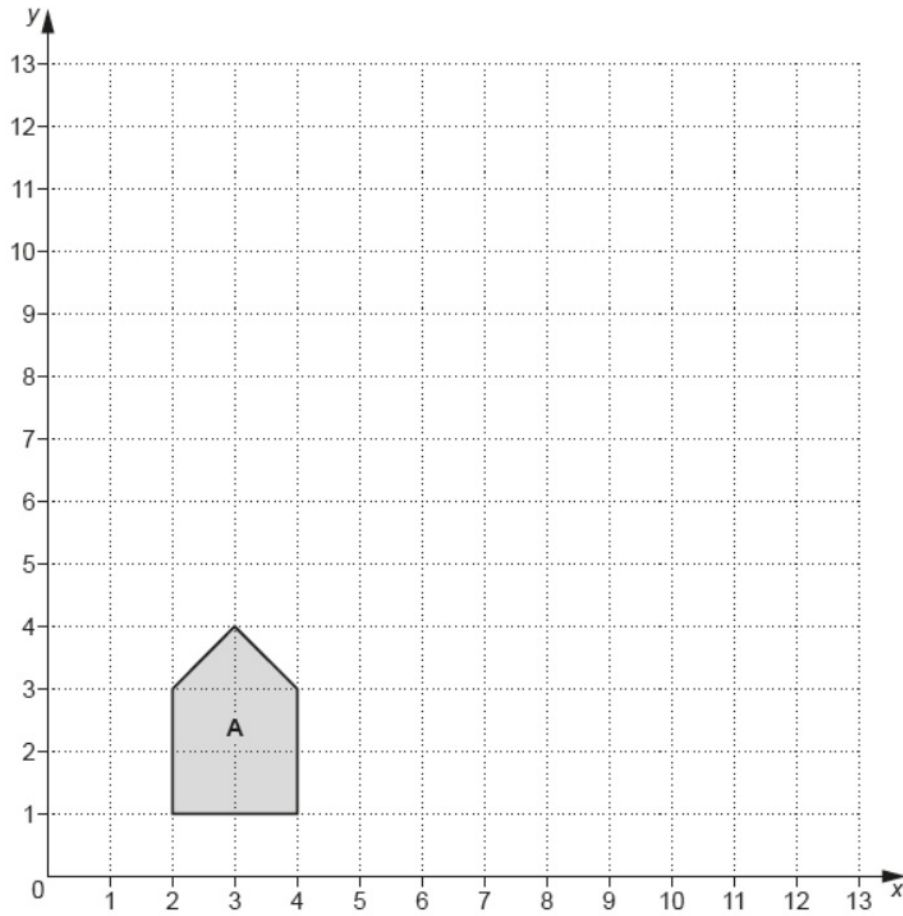
Rotation
 90° clockwise
 from $(0,0)$ ✓

- (a) Translate triangle **A** by vector $\begin{pmatrix} 3 \\ -5 \end{pmatrix}$ — R/L [2]
 +
 UD
- (b) Describe fully the **single** transformation that maps triangle **A** onto triangle **B**.

.....
 [3]

9 Shape **A** is drawn on the grid below.

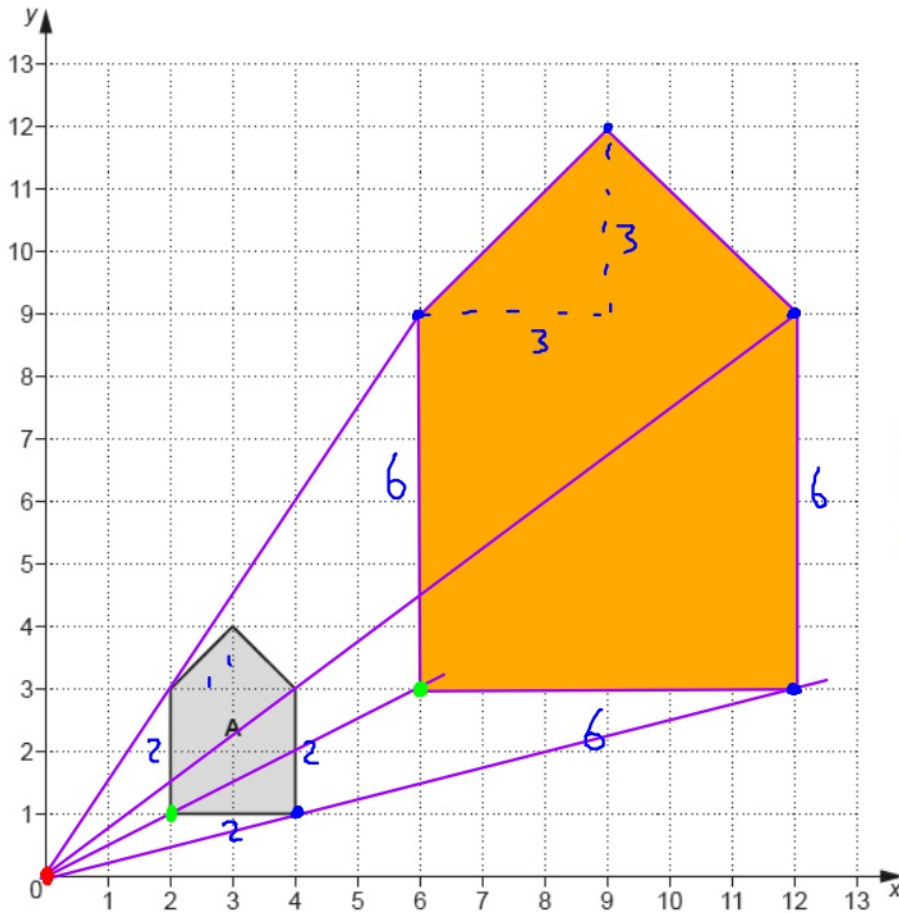
Created by W Neill



Enlarge shape **A** with scale factor 3 and centre of enlargement (0, 0).

[3]

9 Shape A is drawn on the grid below.



Created by W Neill

x Sf 3

Red \rightarrow Green 2R 1UP

Red \rightarrow new 6R 3UP

Red \rightarrow Blue 4R 1UP

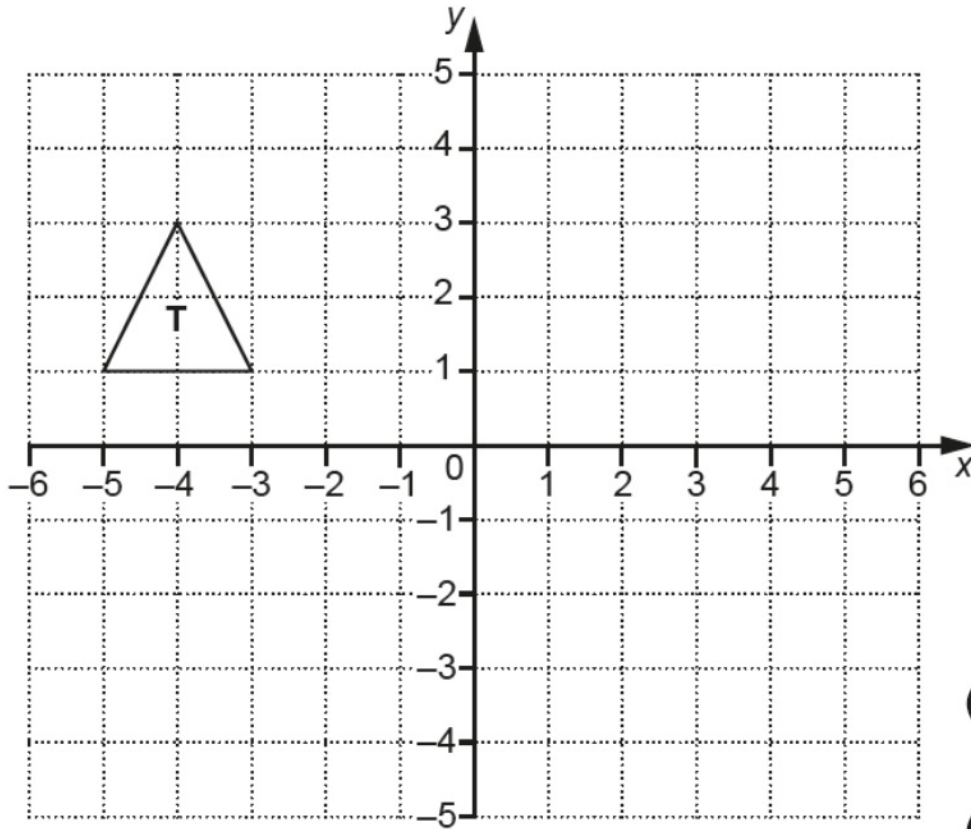
Red \rightarrow new 12R 3UP

Enlarge shape A with scale factor 3 and centre of enlargement (0, 0).

[3]

8 Triangle **T** is drawn on a coordinate grid.

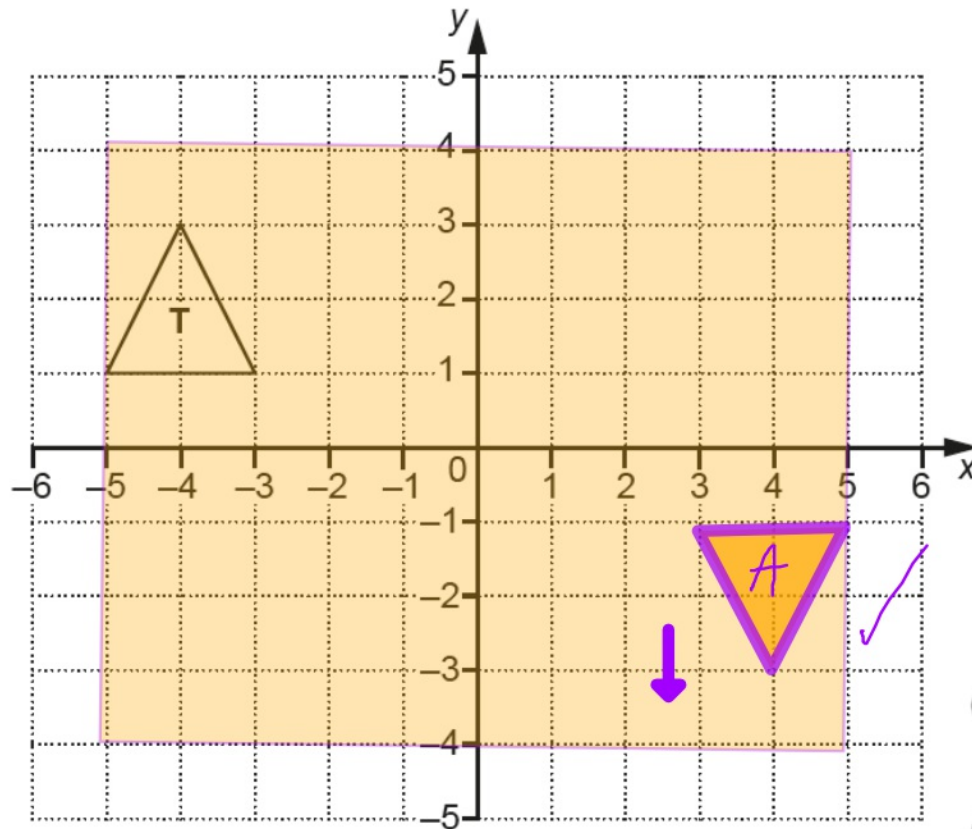
Created by W Neill



- (a) Rotate triangle **T** through 180° about $(0, 0)$.
Label your image **A**.
- (b) Reflect triangle **T** in the line $x = -1$.
Label your image **B**.

8 Triangle **T** is drawn on a coordinate grid.

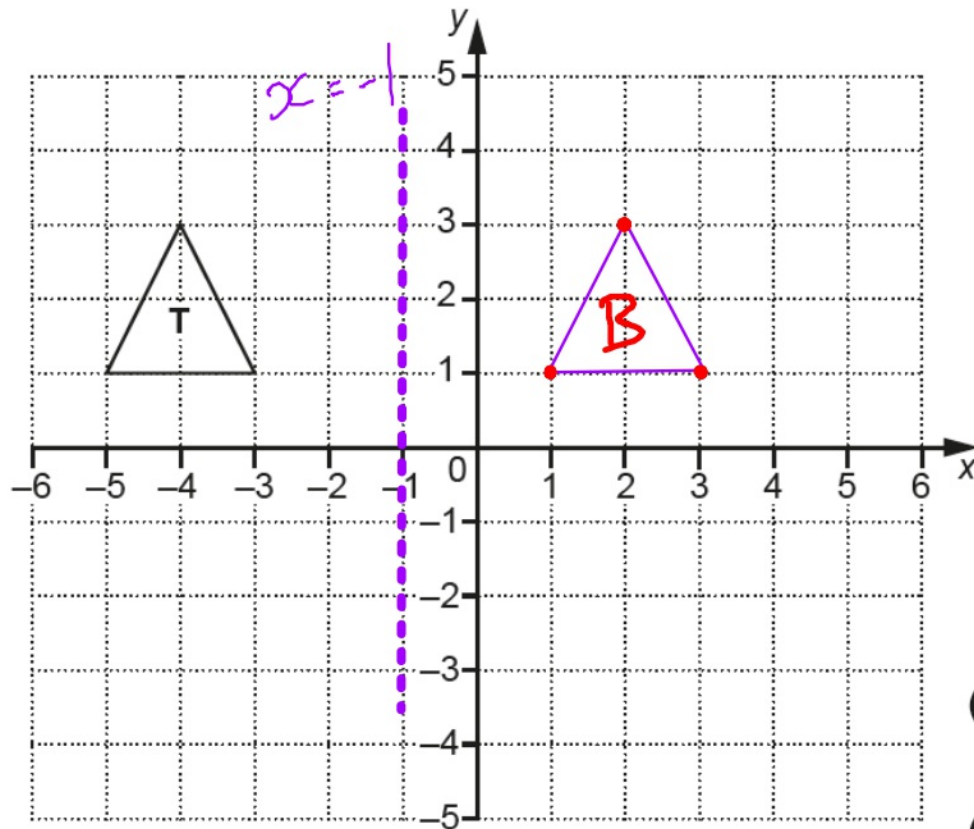
Created by W Neill



- (a) Rotate triangle **T** through 180° about $(0, 0)$.
Label your image **A**.
- (b) Reflect triangle **T** in the line $x = -1$.
Label your image **B**.

8 Triangle **T** is drawn on a coordinate grid.

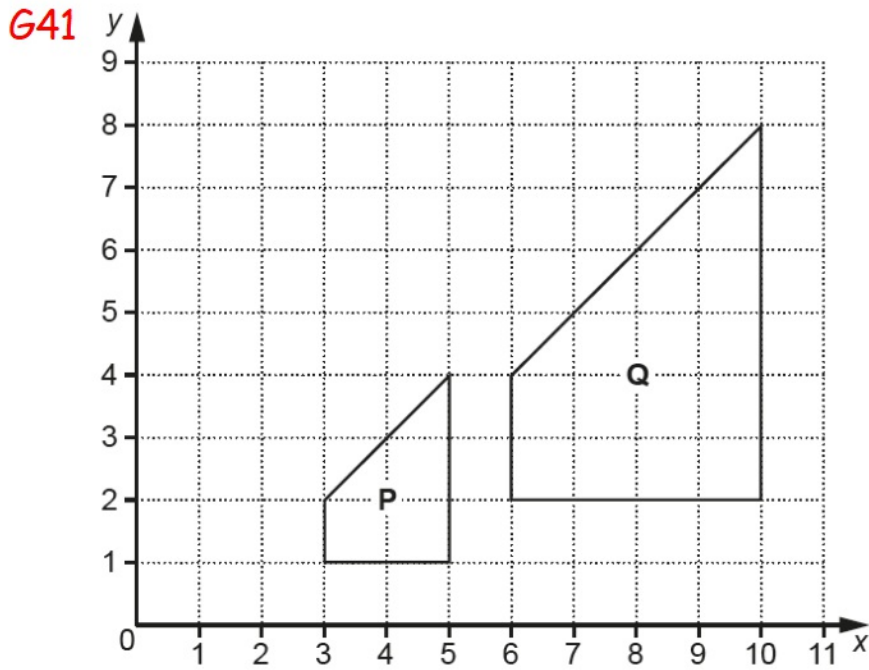
Created by W Neill



- (a) Rotate triangle **T** through 180° about $(0, 0)$. Label your image **A**.
- (b) Reflect triangle **T** in the line $x = -1$. Label your image **B**.

9 Two shapes are drawn on the grid below.

Created by W Neill

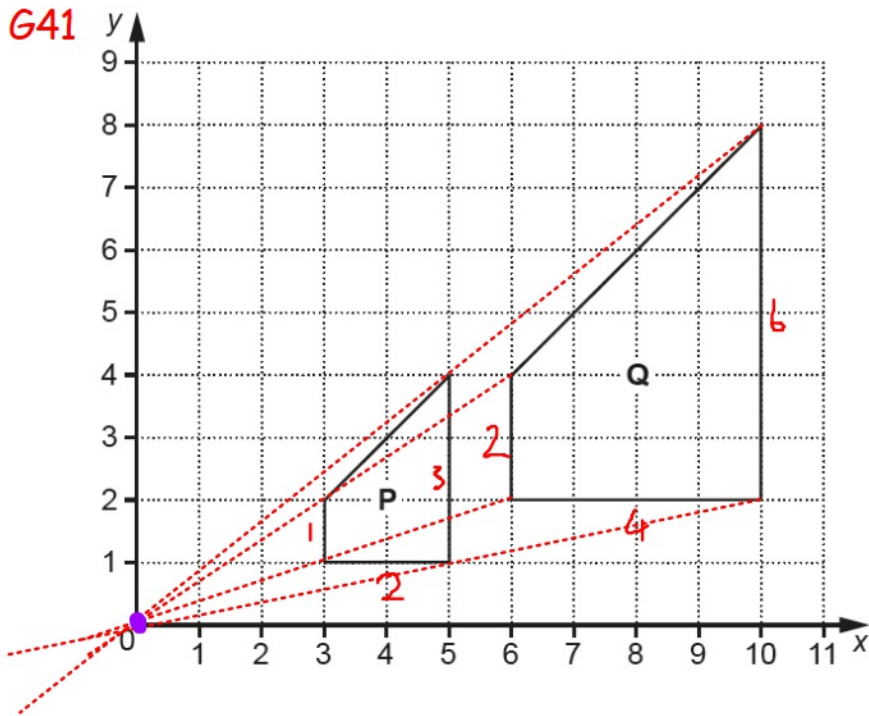


Describe fully the **single** transformation which maps shape **P** onto shape **Q**.

.....
..... [3]

9 Two shapes are drawn on the grid below.

Created by W Neill



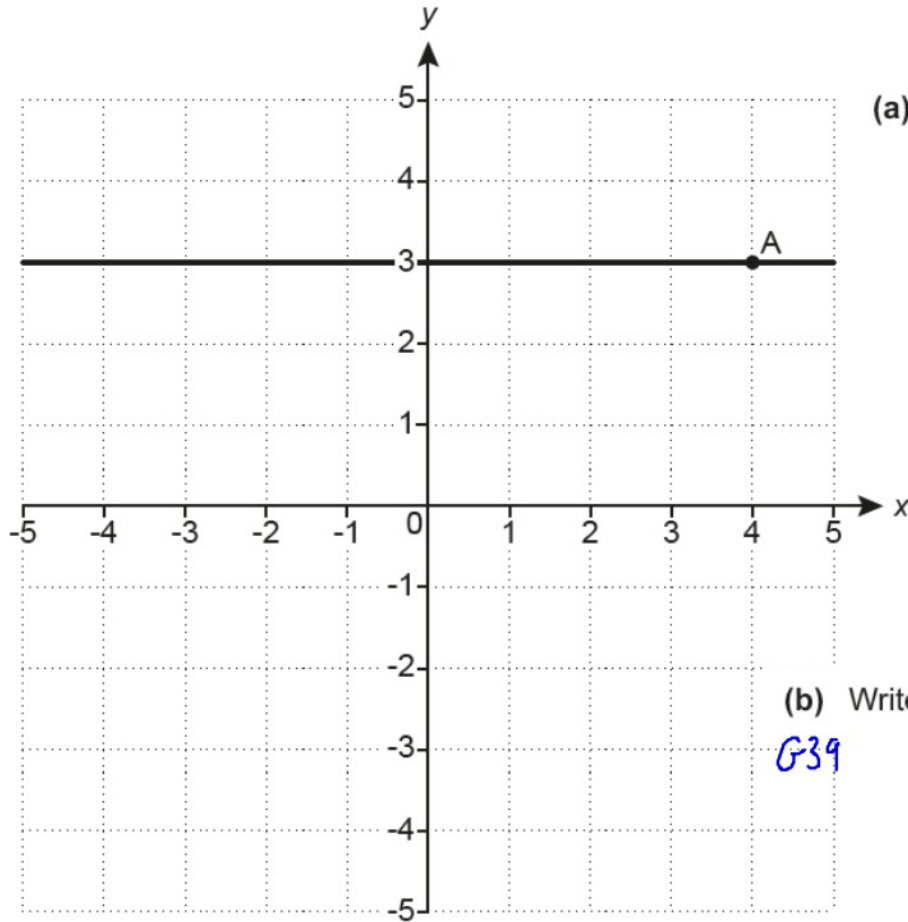
Describe fully the **single** transformation which maps shape **P** onto shape **Q**.

Enlarged by Scale Factor 2, from centre of
enlargement (0,0) or from the origin.

[3]

4 This grid shows a horizontal line going through the point A.

Created by W Neill



(a) (i) Write down the coordinates of point A.

A22

(a)(i) (..... ,) [1]

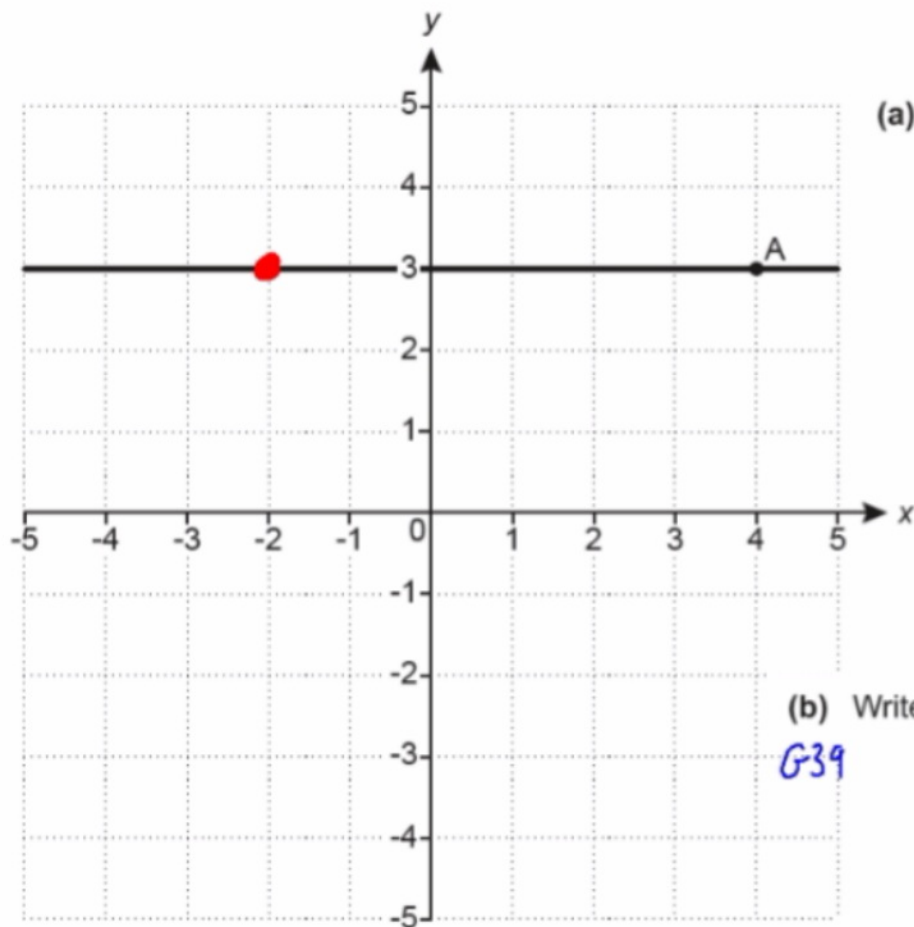
(ii) Plot the point (-2, 3).

(b) Write down the equation of the horizontal line going through point A.

G39

4 This grid shows a horizontal line going through the point A.

Created by WNeill



(a) (i) Write down the coordinates of point A.

A22

(a)(i) (4, 3) [1]

(ii) Plot the point (-2, 3).

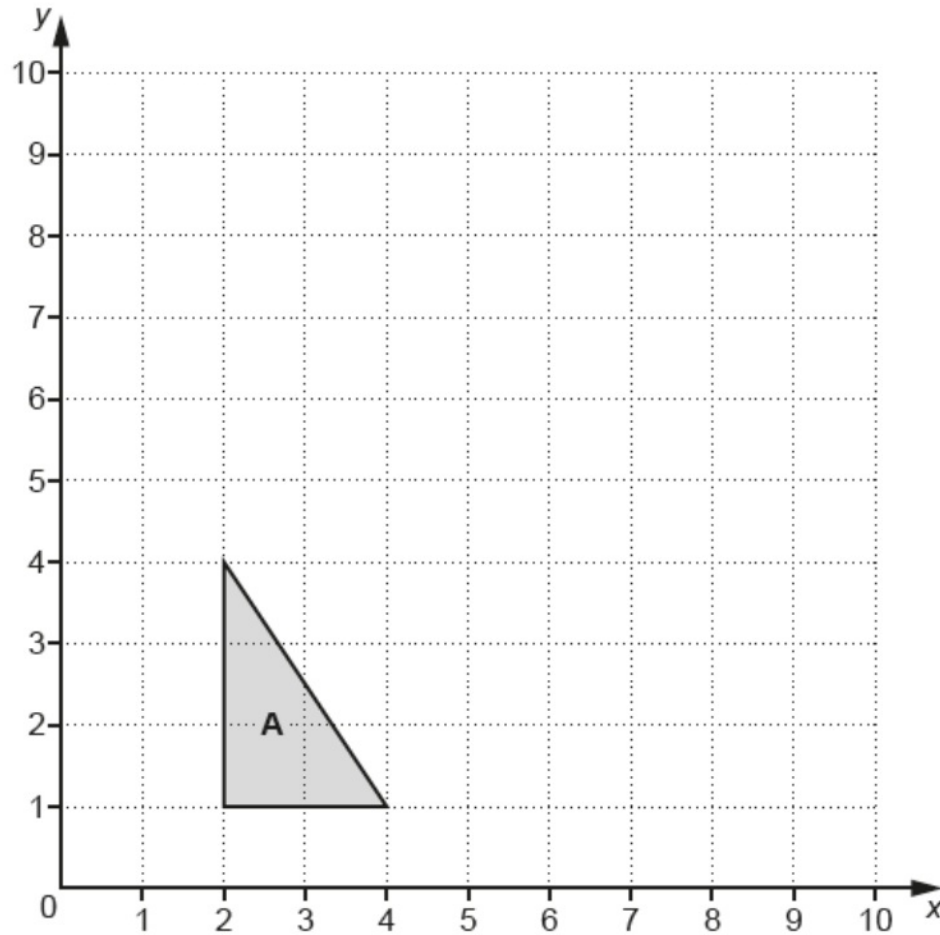
(b) Write down the equation of the horizontal line going through point A

G39

$$y = 3$$

10 Triangle **A** is drawn on the grid below.

G41

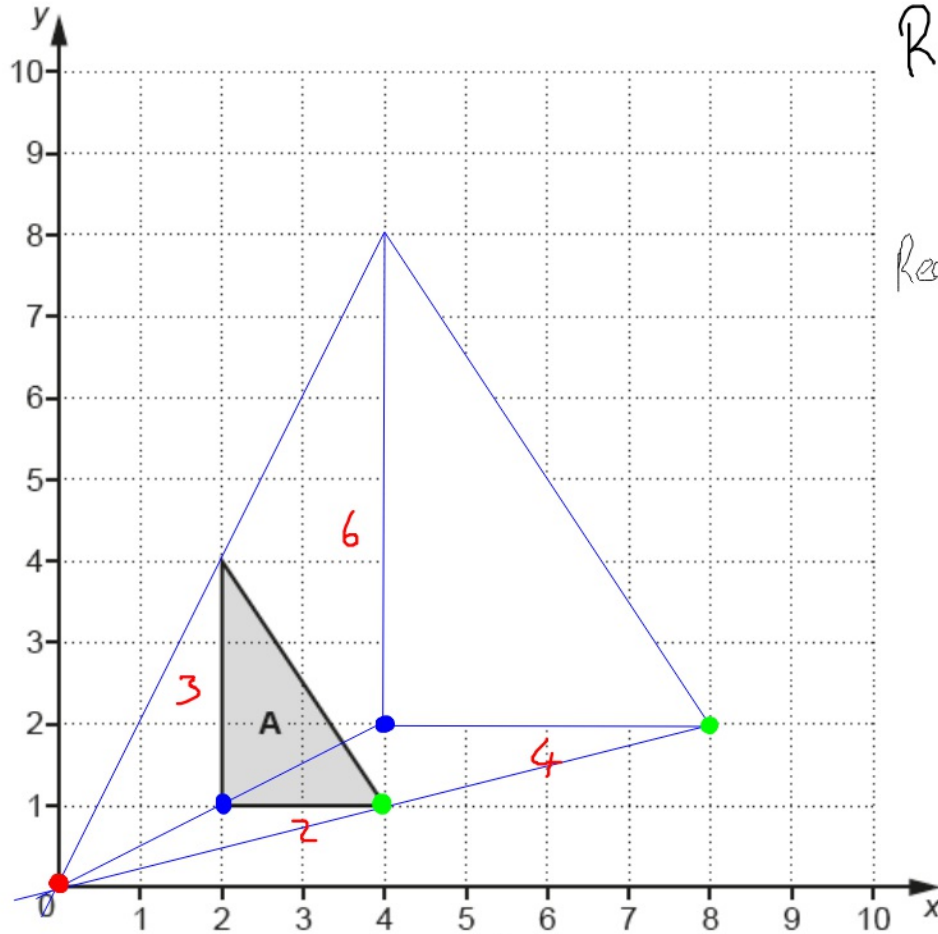


Enlarge triangle **A** with scale factor 2 and centre of enlargement (0, 0).

[3]

10 Triangle A is drawn on the grid below.

G41



Red \rightarrow Blue R2 U1
 R4 U2

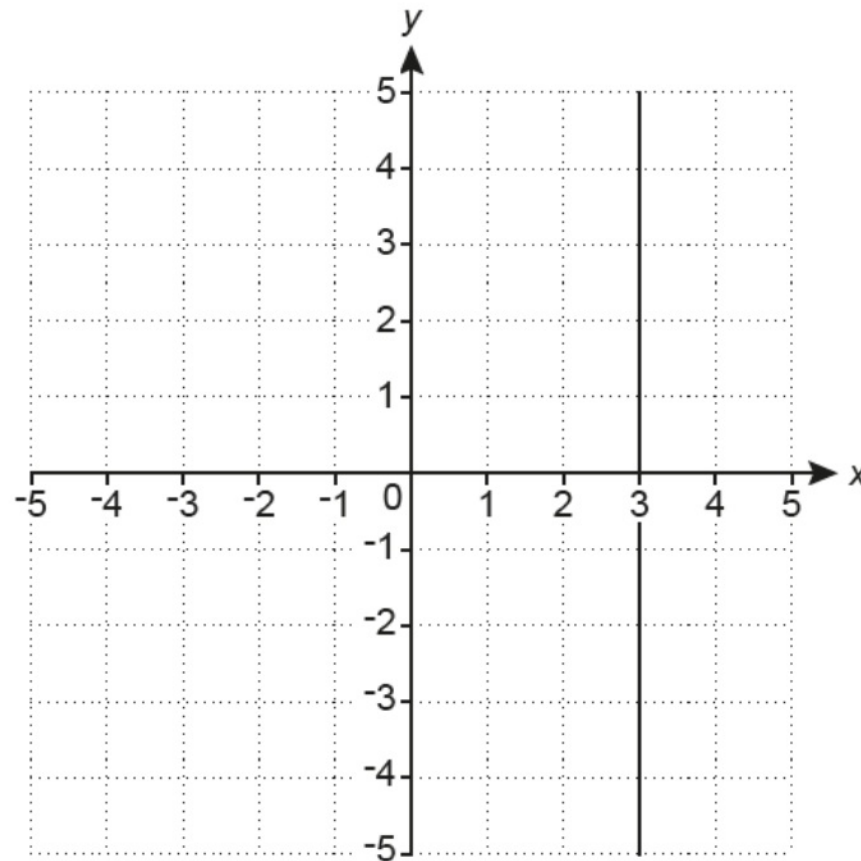
Red \rightarrow Green R4 U1
 x2 R8 U2

Enlarge triangle A with scale factor 2 and centre of enlargement (0, 0).

[3]

10 (a) Write down the equation of each of these lines.

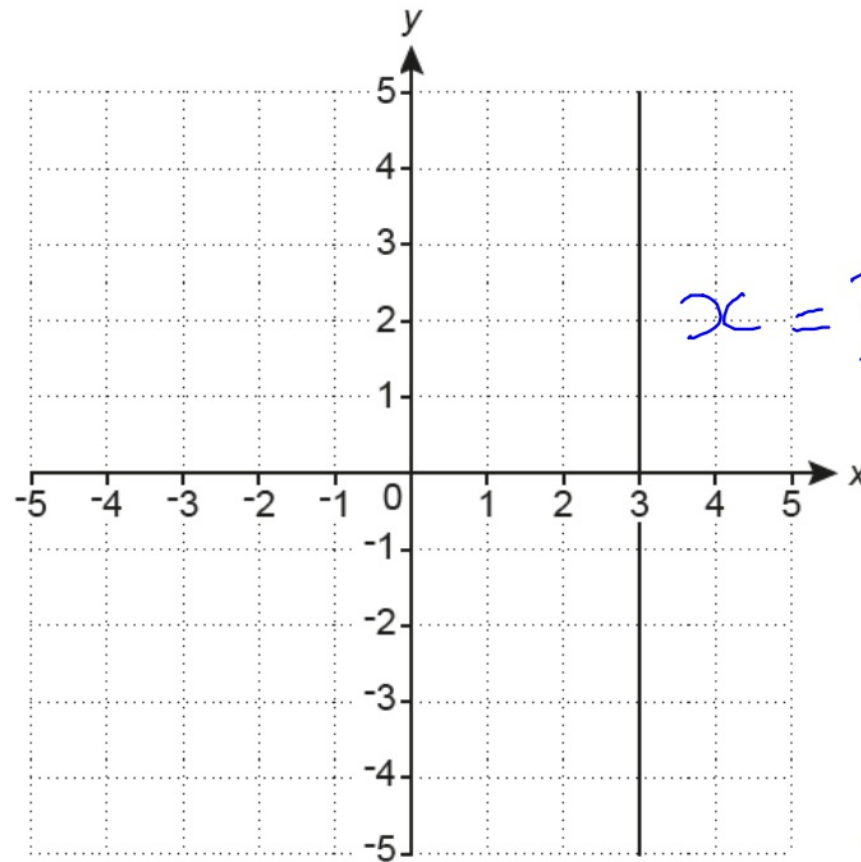
G39 (i)



(a)(i) [1]

10 (a) Write down the equation of each of these lines.

G39 (i)

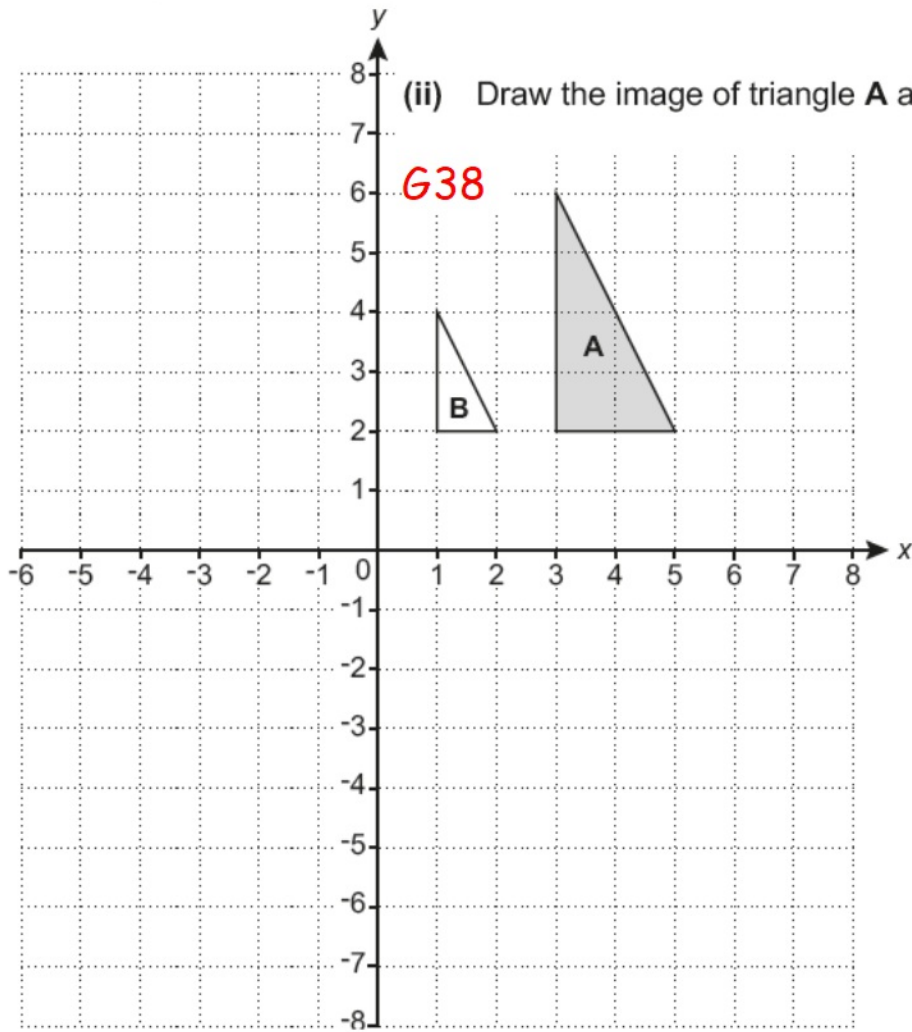


(a)(i) [1]

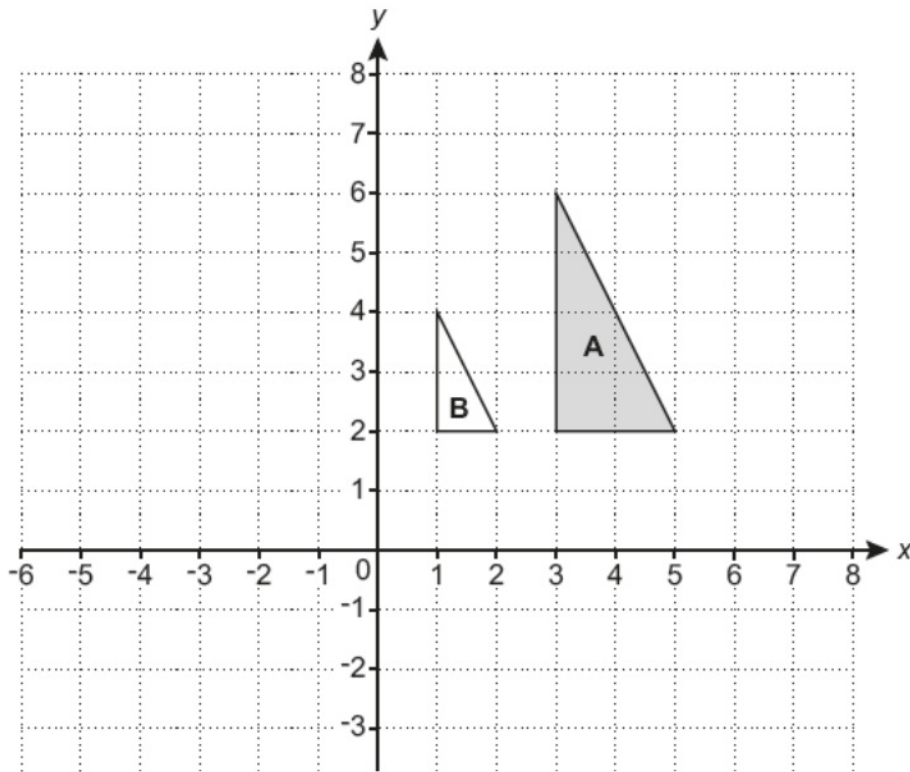
19 Triangle **A** and triangle **B** are drawn on the coordinate grid.

(ii) Draw the image of triangle **A** after a translation by the vector $\begin{pmatrix} 2 \\ -7 \end{pmatrix}$.

[2]



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



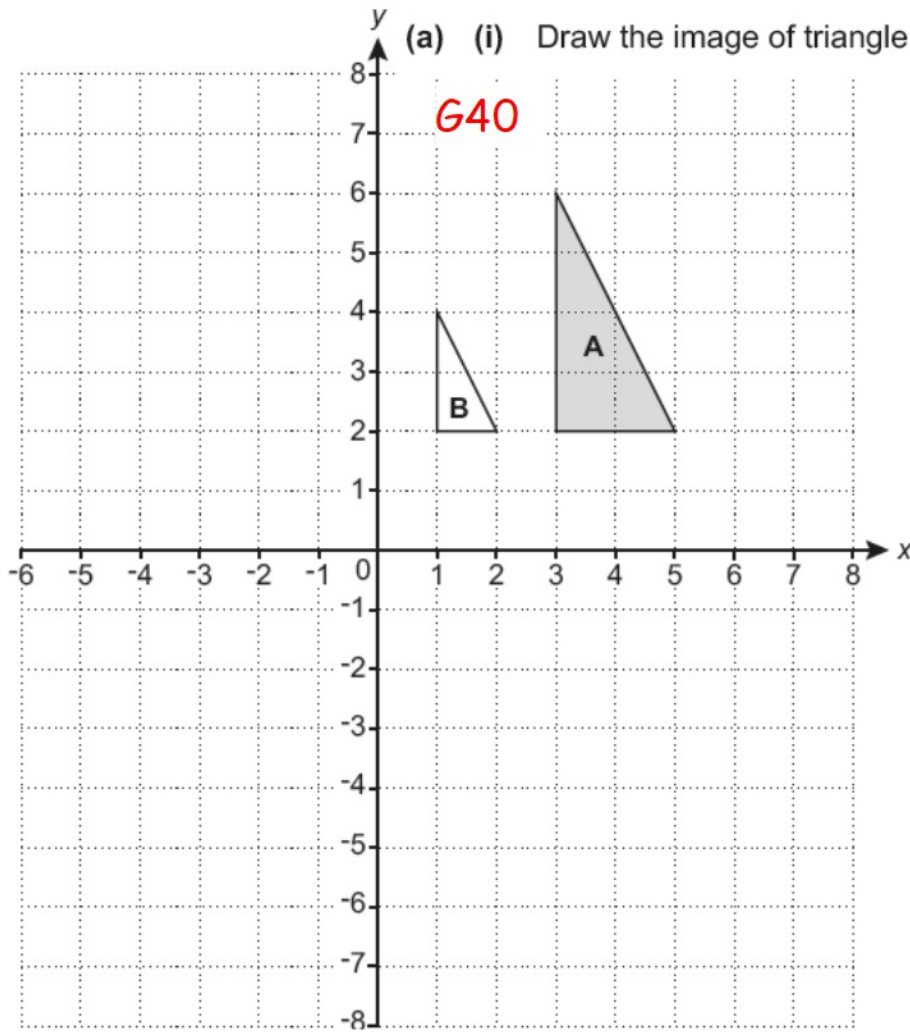
(b) Describe fully the **single** transformation that maps triangle **A** onto triangle **B**.

G41
..... [3]

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

(a) (i) Draw the image of triangle **A** after a rotation of 180° about $(0, 0)$.

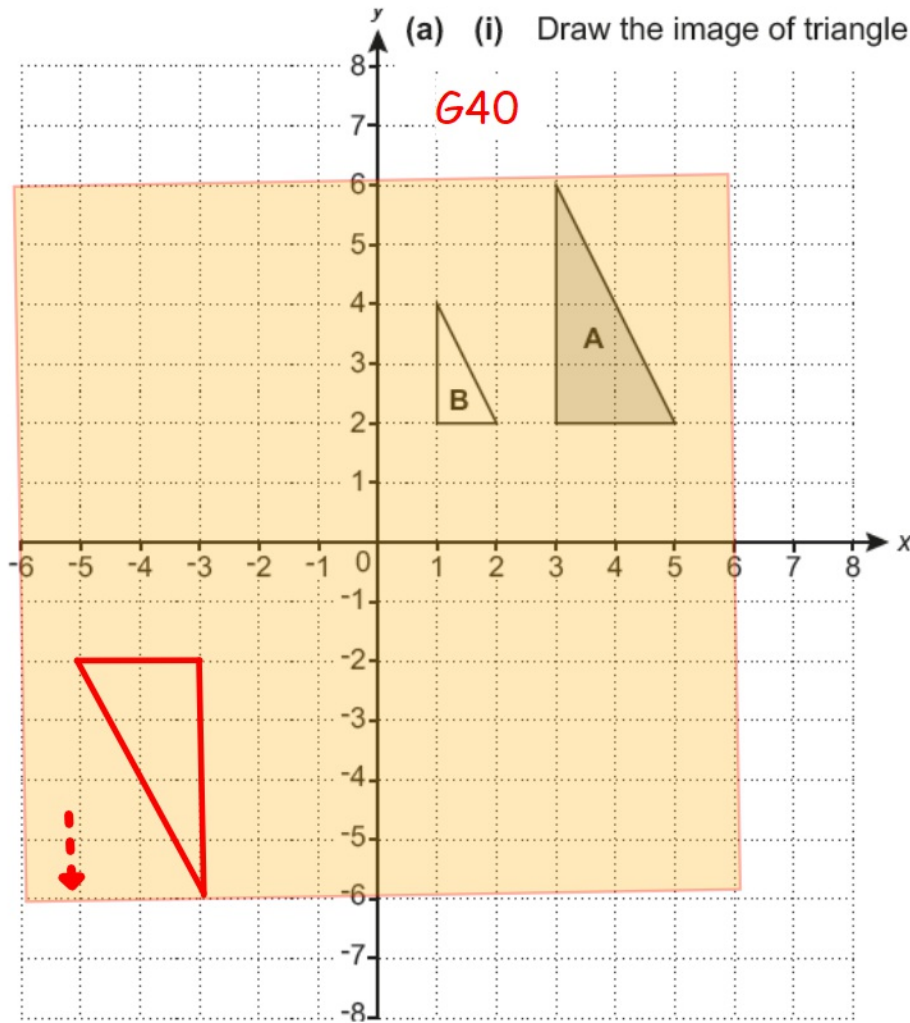
[2]



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

(a) (i) Draw the image of triangle **A** after a rotation of 180° about $(0, 0)$.

[2]



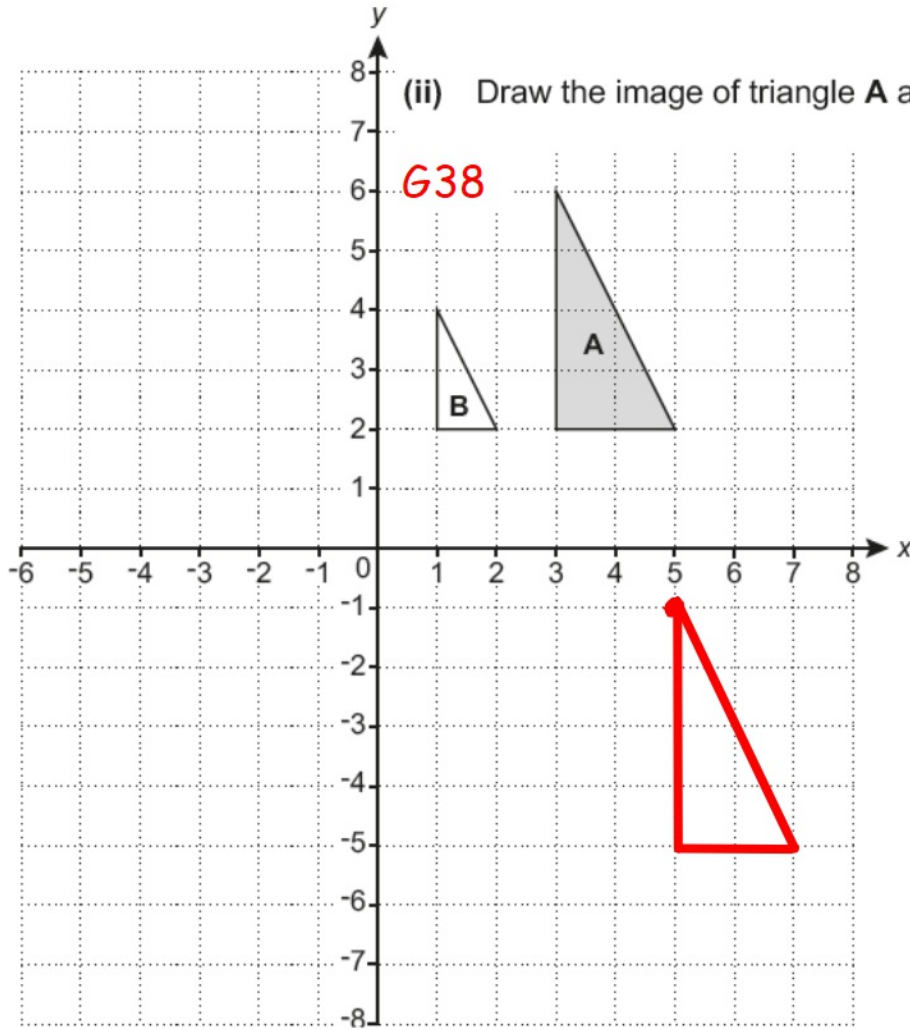
19 Triangle **A** and triangle **B** are drawn on the coordinate grid.

Video created by Will Neill

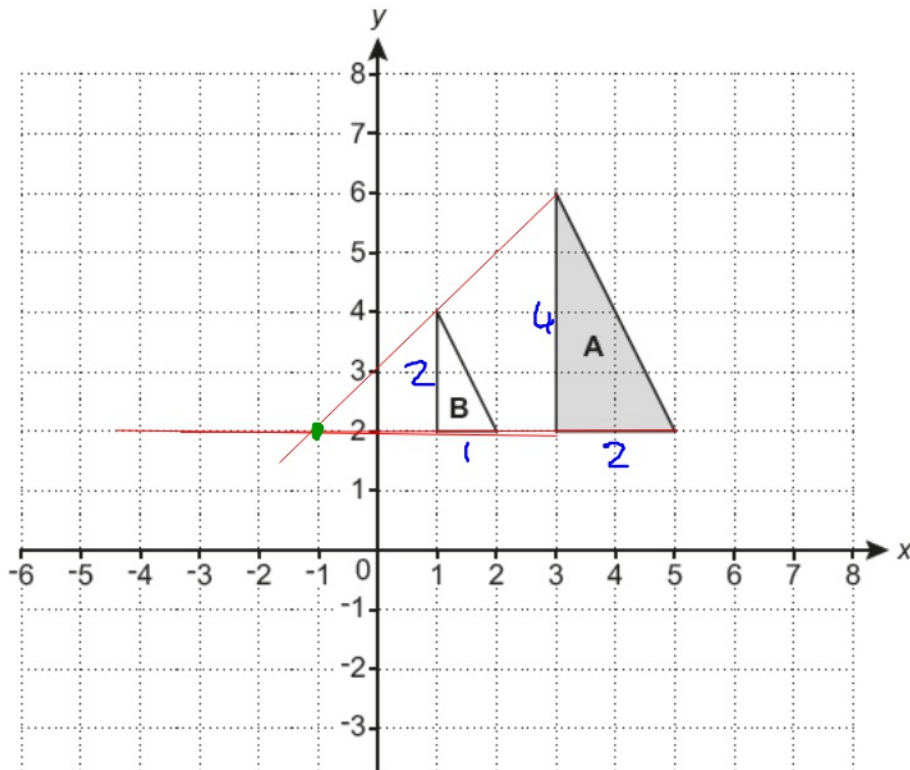
(ii) Draw the image of triangle **A** after a translation by the vector $\begin{pmatrix} 2 \\ -7 \end{pmatrix}$.

$\begin{pmatrix} 2 \\ -7 \end{pmatrix}$ — Right / Left⁺ —
— Up / Down⁺ — [2]

G38



19 Triangle A and triangle B are drawn on the coordinate grid.



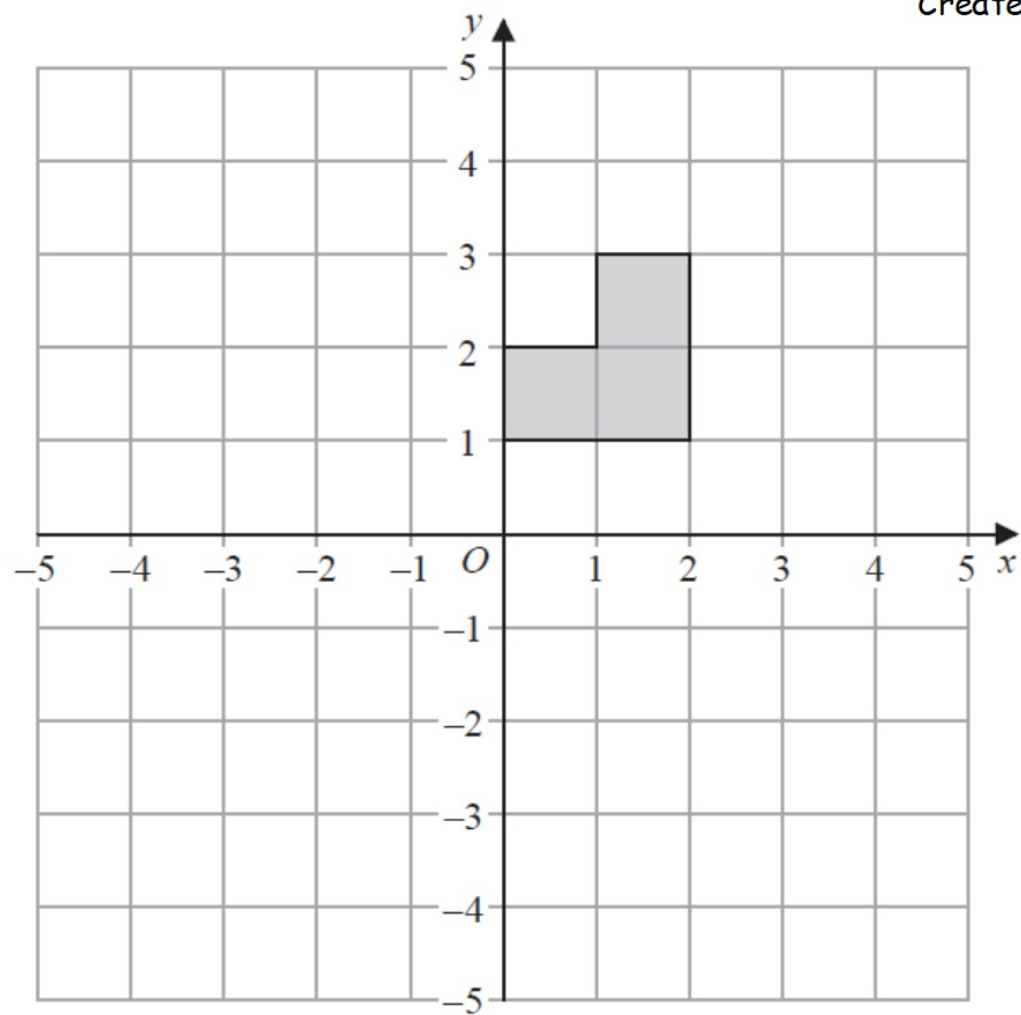
(b) Describe fully the **single** transformation that maps triangle A onto triangle B.

G41 enlargement by Sf $\frac{1}{2}$ with centre of enlargement $(-1, 2)$ [3]

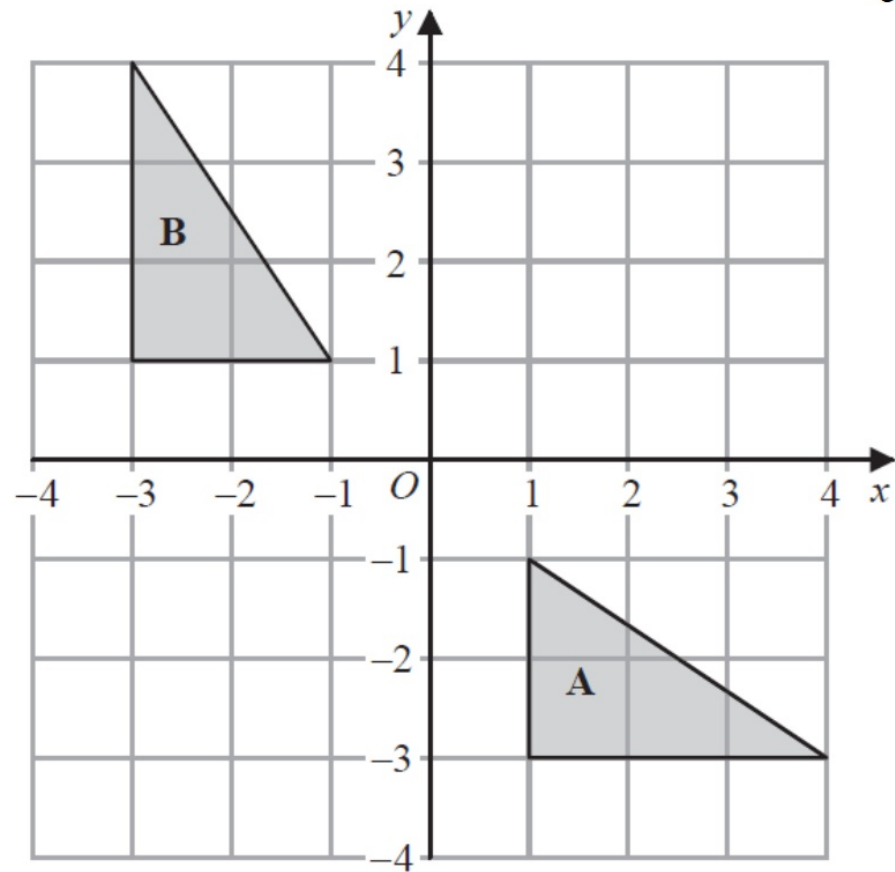
Edexcel

17

Created by W Neill



(a) On the grid above, reflect the shaded shape in the line with equation $x = -1$



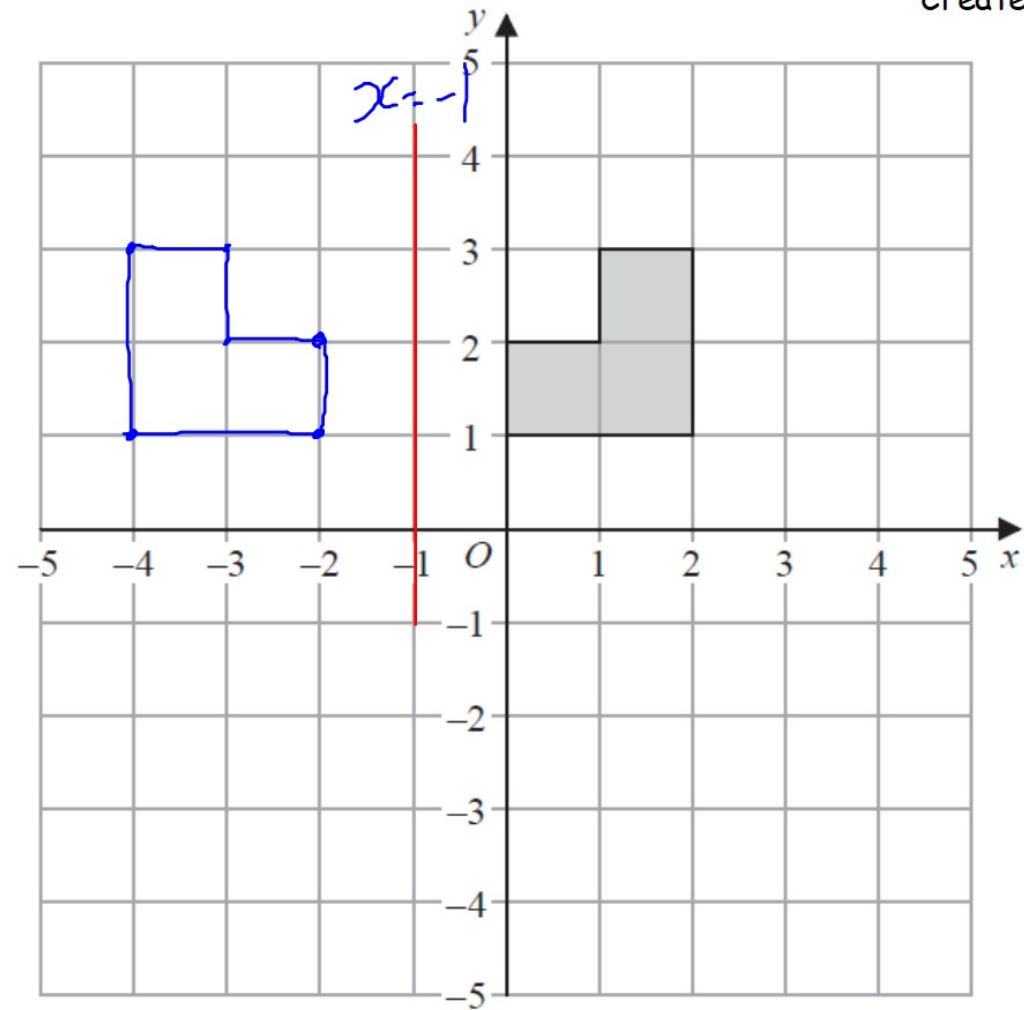
Triangle **A** is a reflection of triangle **B**.

(b) Write down the equation of the line of reflection.

.....
(1)

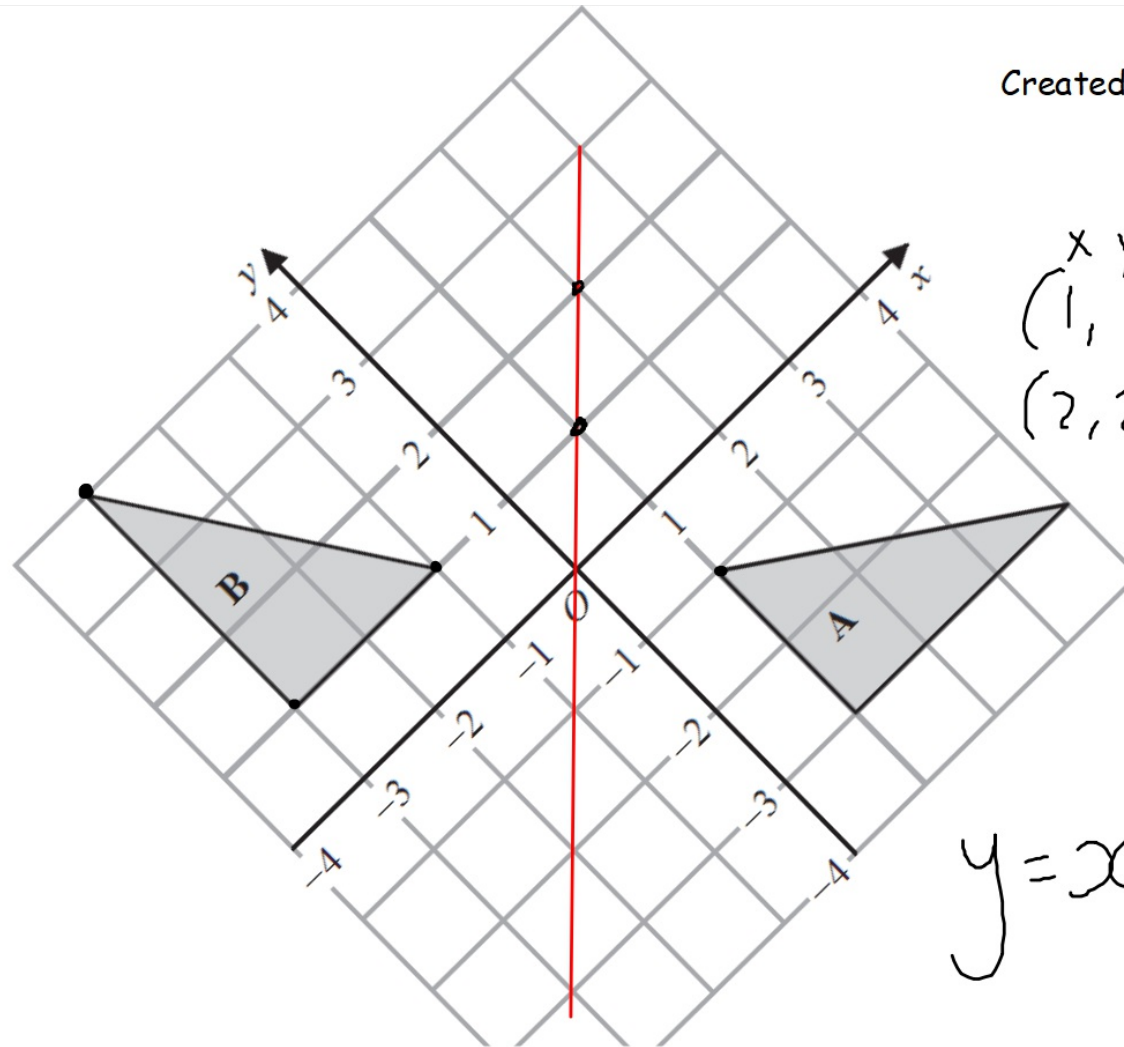
17

Created by W Neill



(a) On the grid above, reflect the shaded shape in the line with equation $x = -1$

Created by W Neill



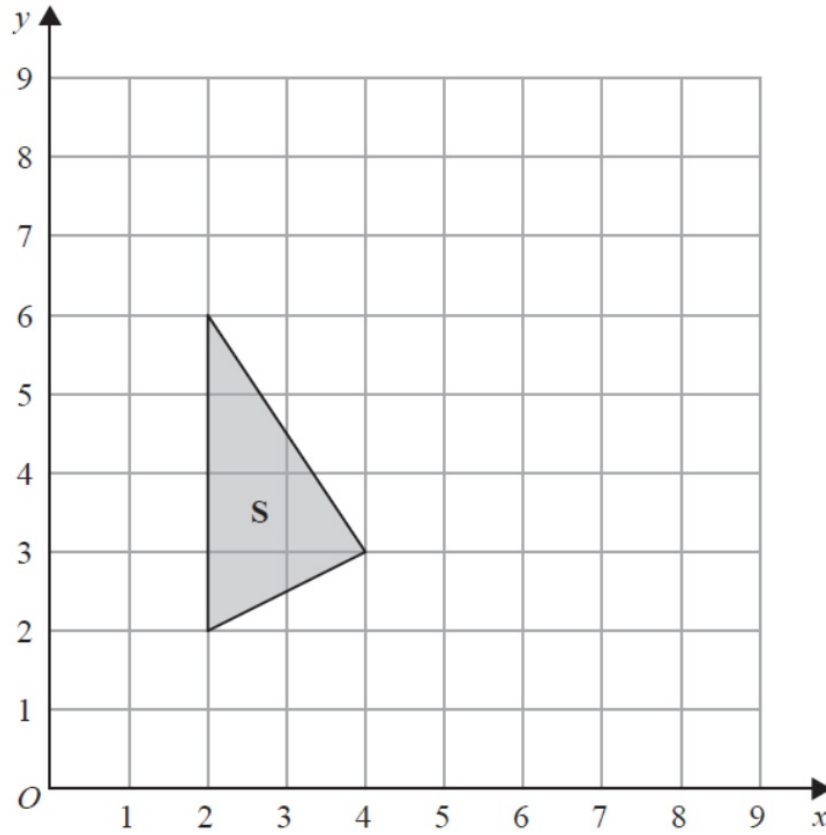
Triangle **A** is a reflection of triangle **B**.

(b) Write down the equation of the line of reflection.

.....
(1)

20

Created by W Neill



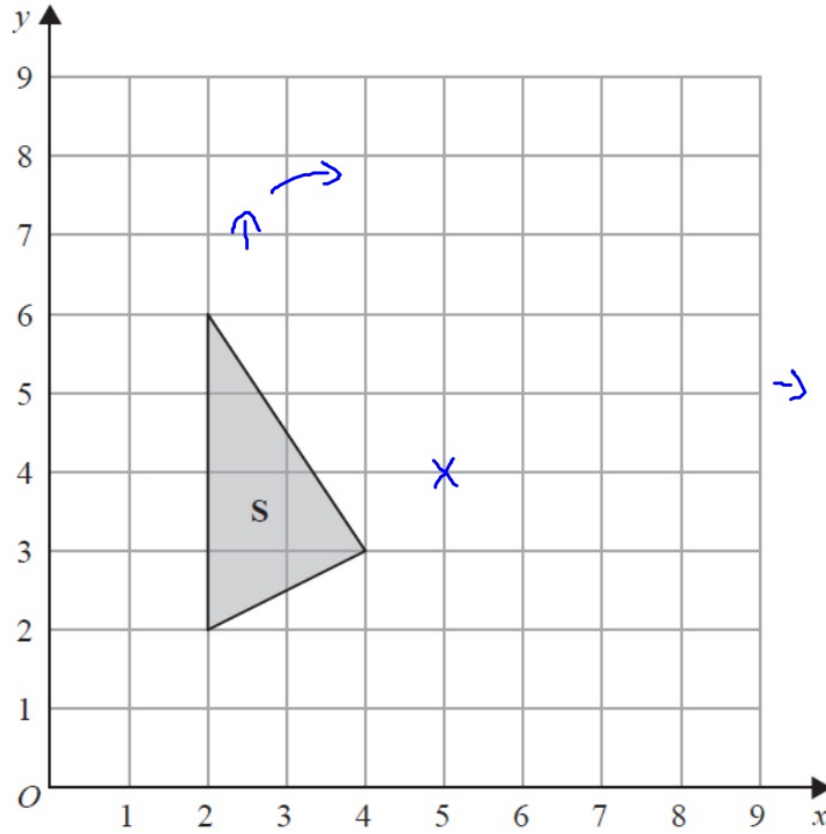
- (a) Rotate shape **S** 90° clockwise, centre (5, 4)
Label your image **T**.

(2)

- (b) Describe fully the single transformation that will map shape **T** onto shape **S**.

.....
(1)

2



Created by W Neill

- (a) Rotate shape S 90° clockwise, centre (5, 4)
Label your image T.

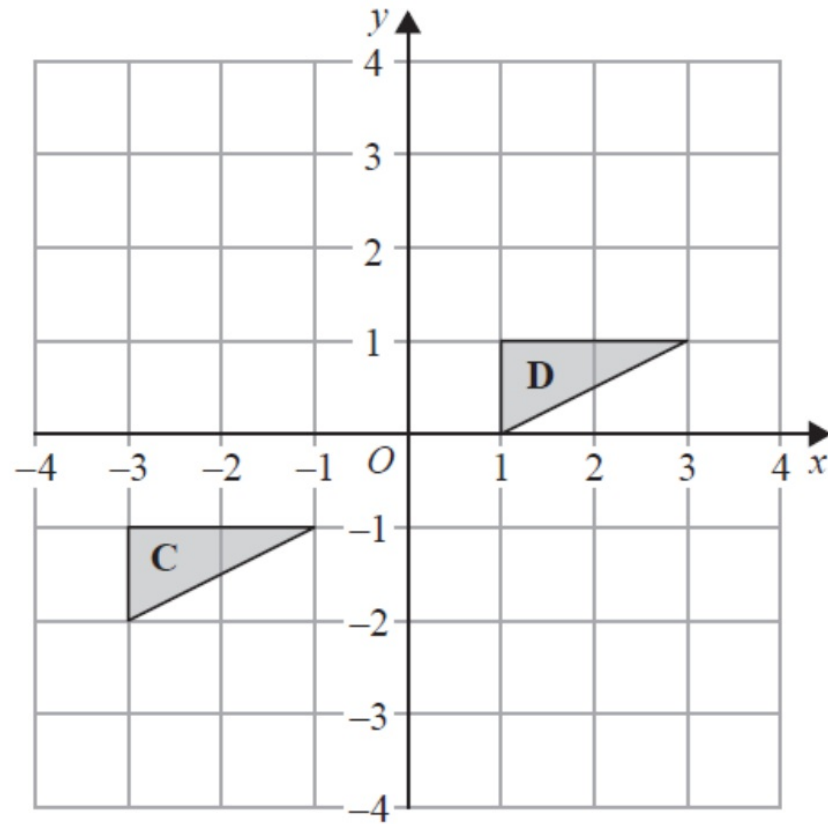
(2)

- (b) Describe fully the single transformation that will map shape T onto shape S.

.....
(1)

11

Created by W Neill



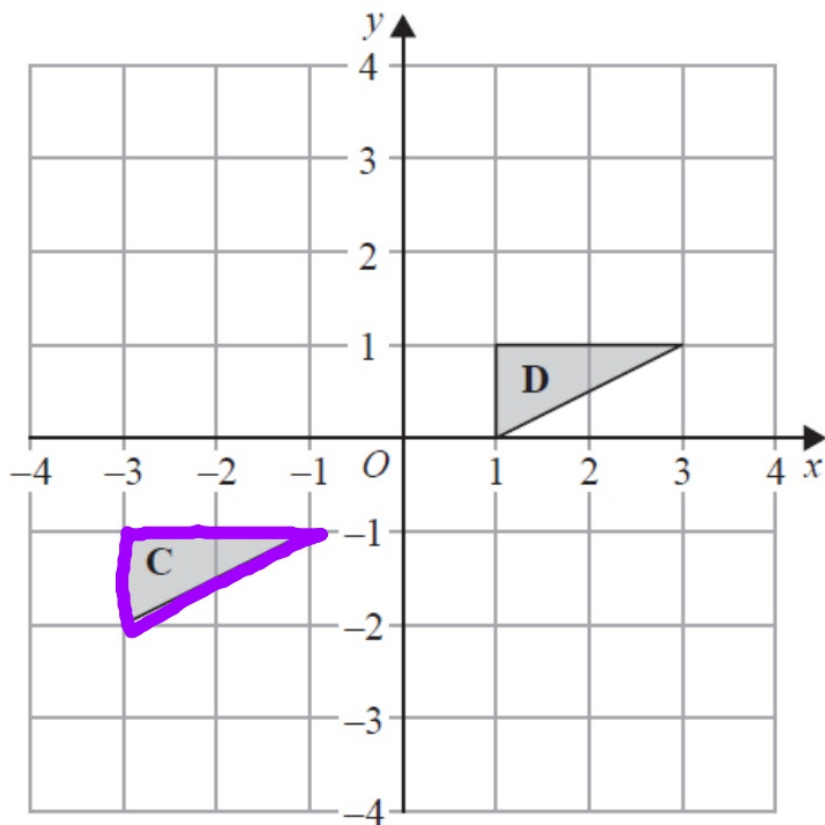
Describe fully the single transformation that maps triangle **C** onto triangle **D**.

.....

.....

(Total for Question 11 is 2 marks)

Translation ✓
 Reflection
 Rotation
 Enlargement



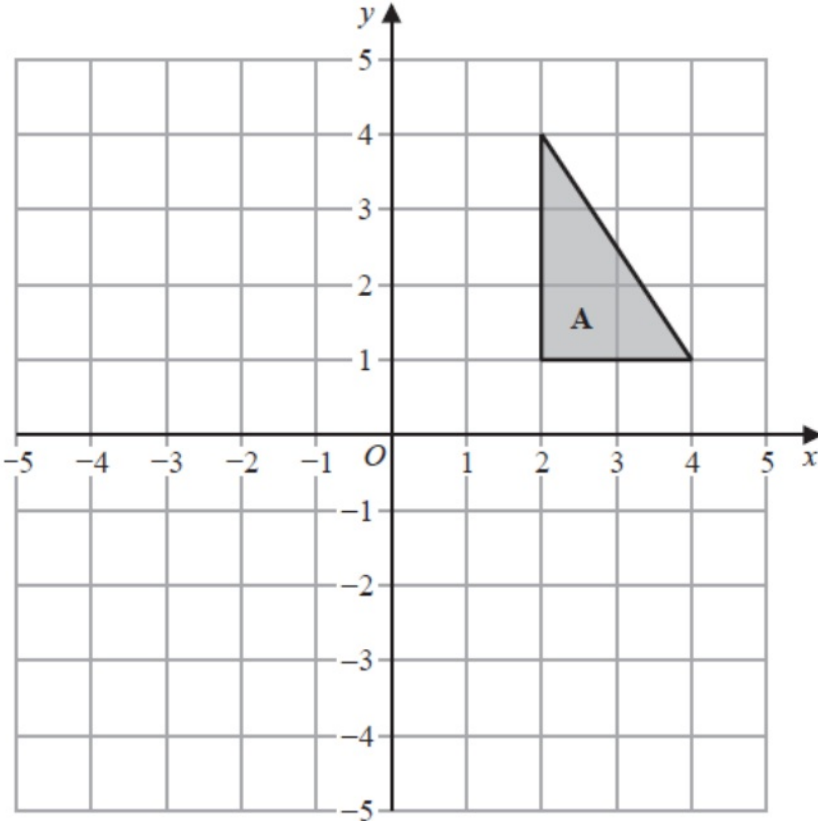
Describe fully the single transformation that maps triangle C onto triangle D.

Translation by vector $\begin{pmatrix} 4 \\ 2 \end{pmatrix}$ \rightarrow Right/left $\begin{matrix} + \\ - \end{matrix}$
 \rightarrow Up/Down $\begin{matrix} + \\ - \end{matrix}$

(Total for Question 11 is 2 marks)

15

G39

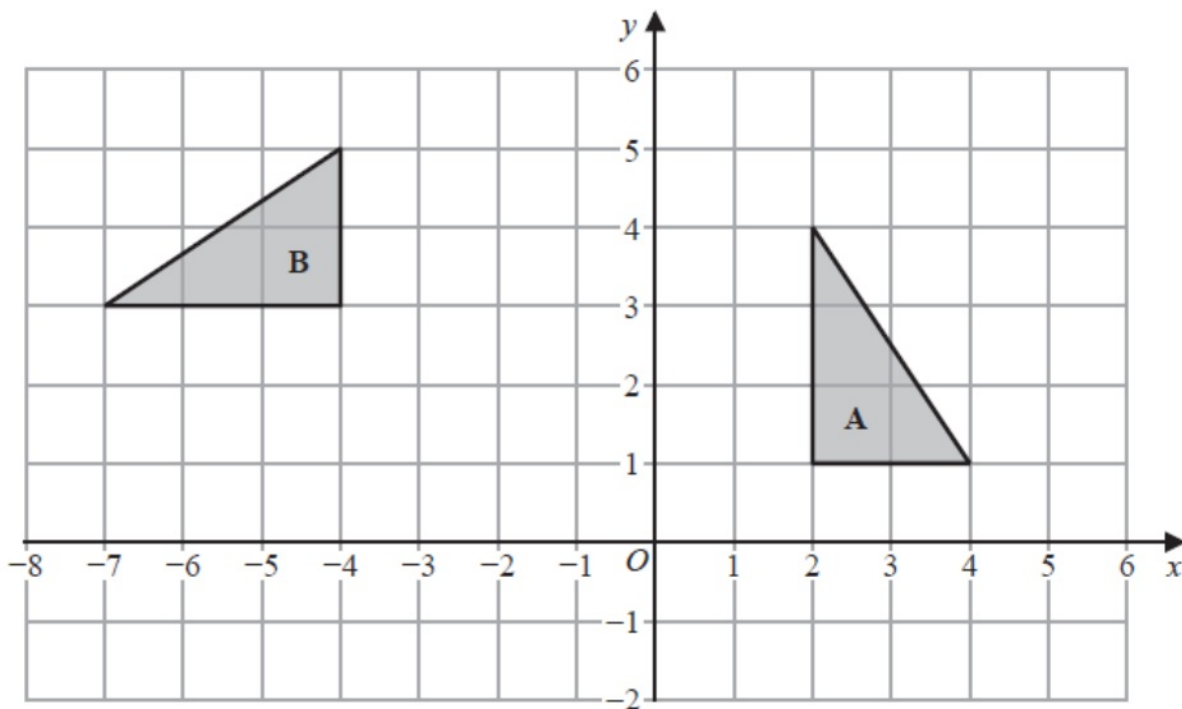


Reflect triangle A in the y-axis.

(Total for Question 15 is 2 marks)

24

G40



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

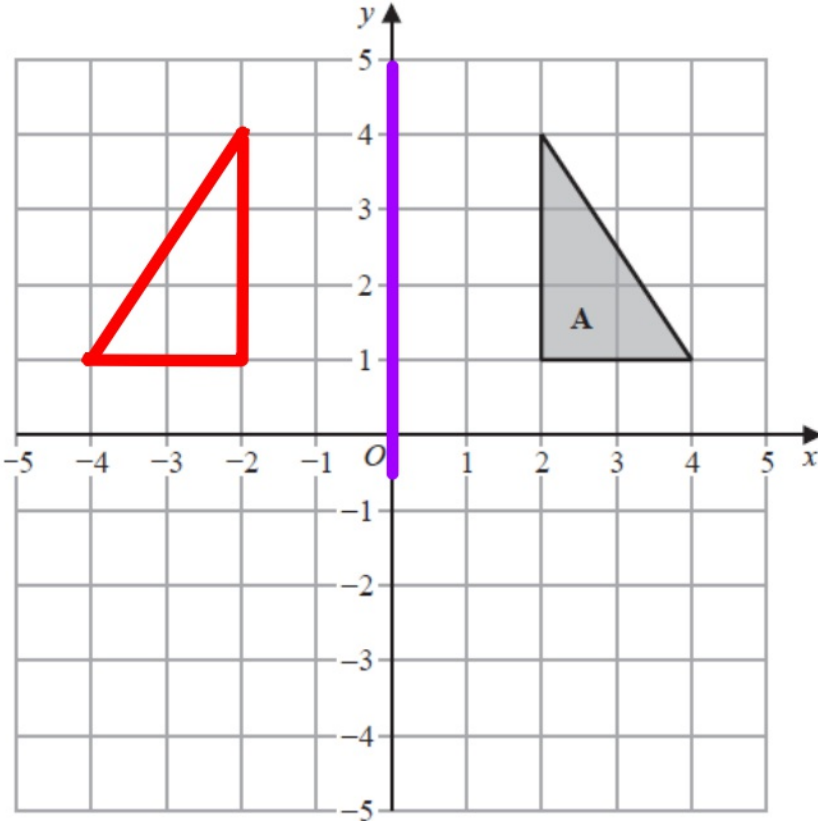
.....

.....

(Total for Question 24 is 2 marks)

15

G39

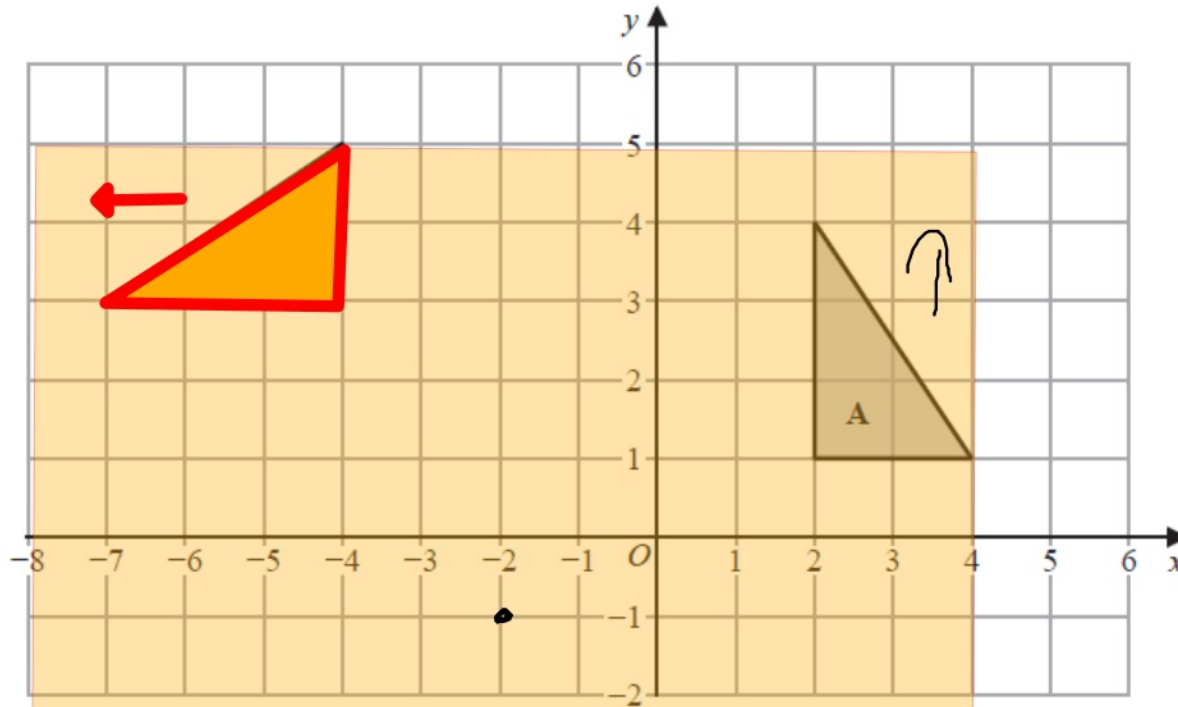


Reflect triangle A in the y-axis.

(Total for Question 15 is 2 marks)

24

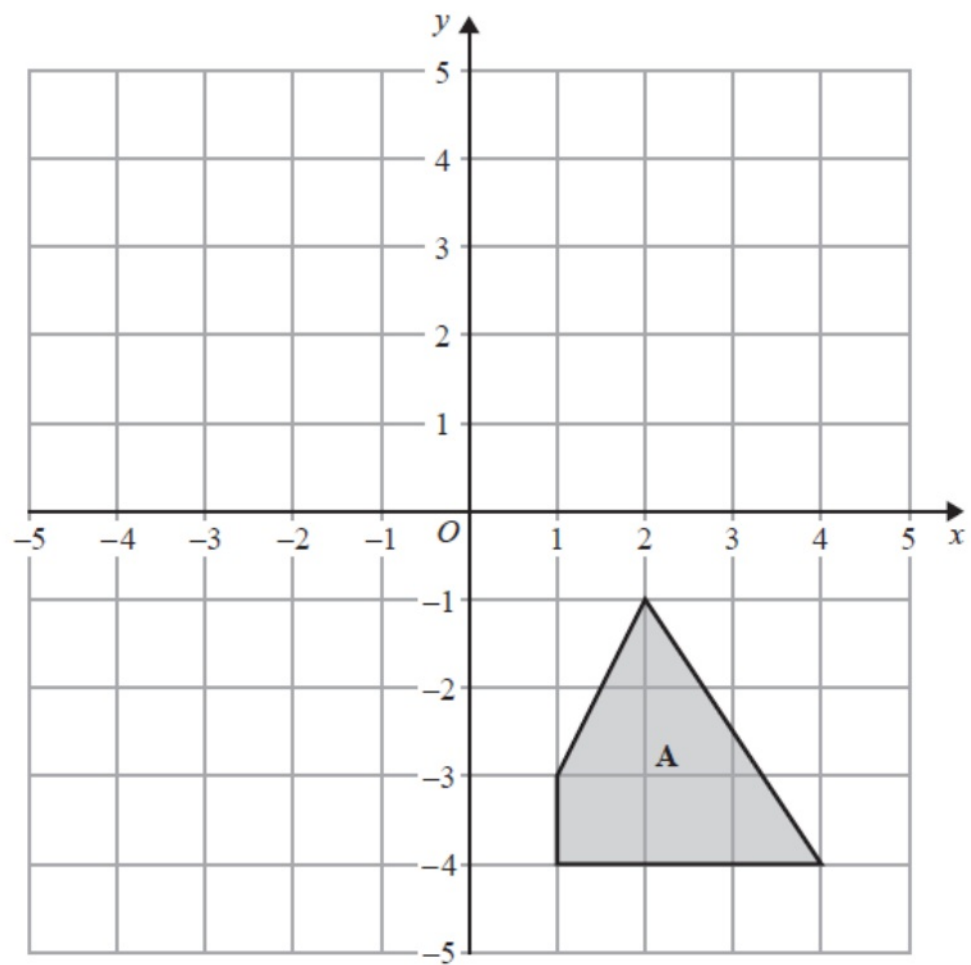
G40



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

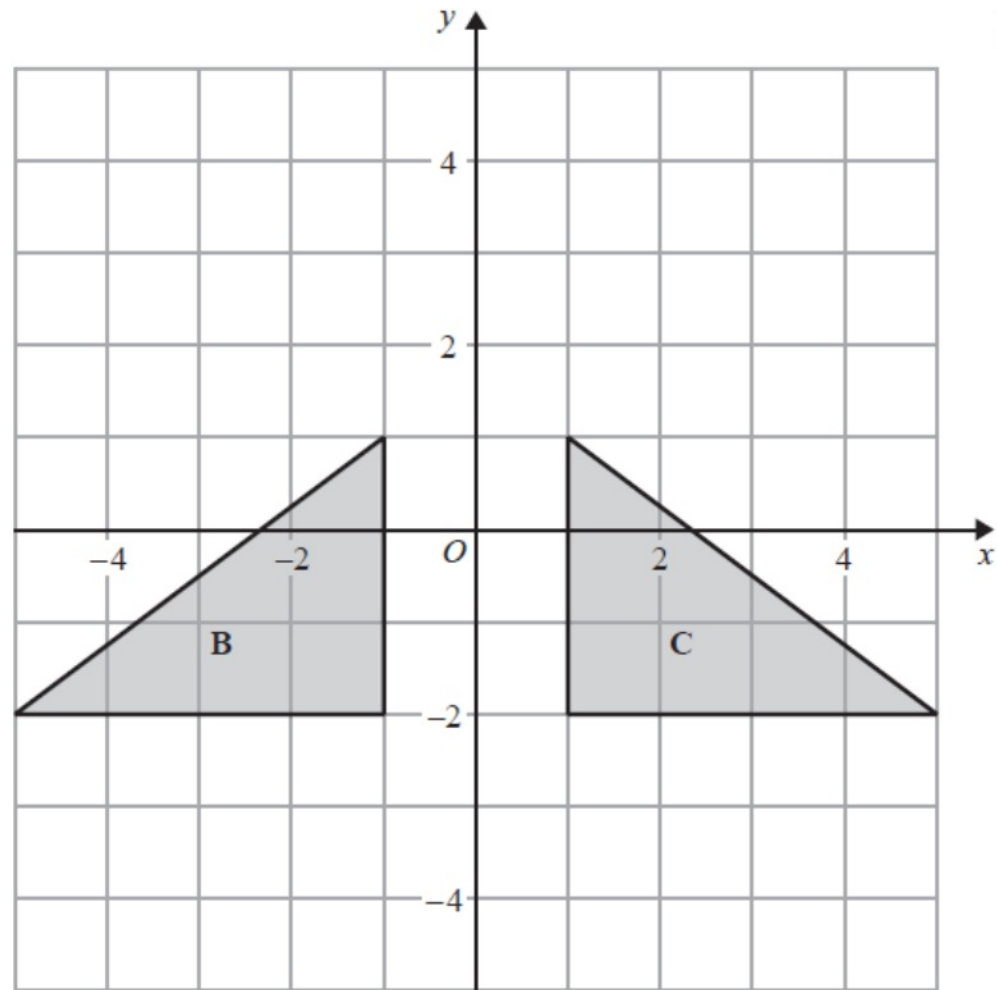
Rotation, 90 acw from $(-2, -1)$

(Total for Question is 2 marks)

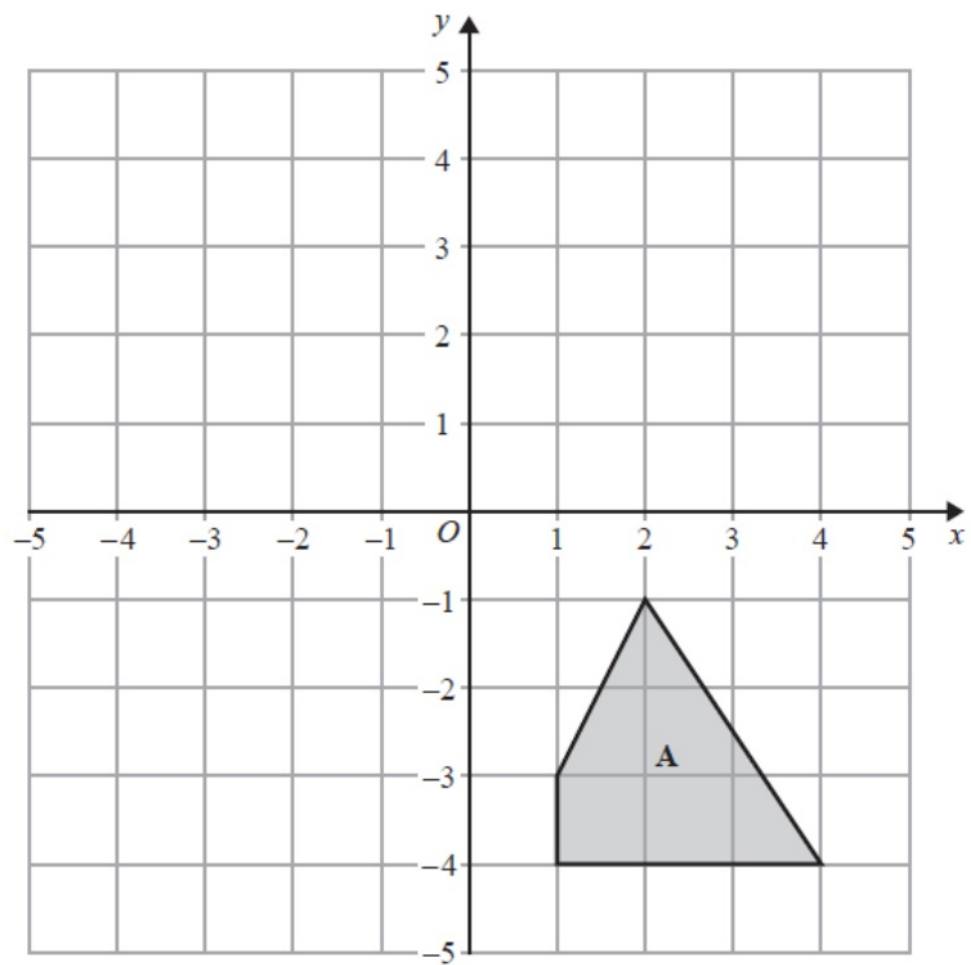


(a) Rotate shape A 90° clockwise about centre O .

Video created by W Neill

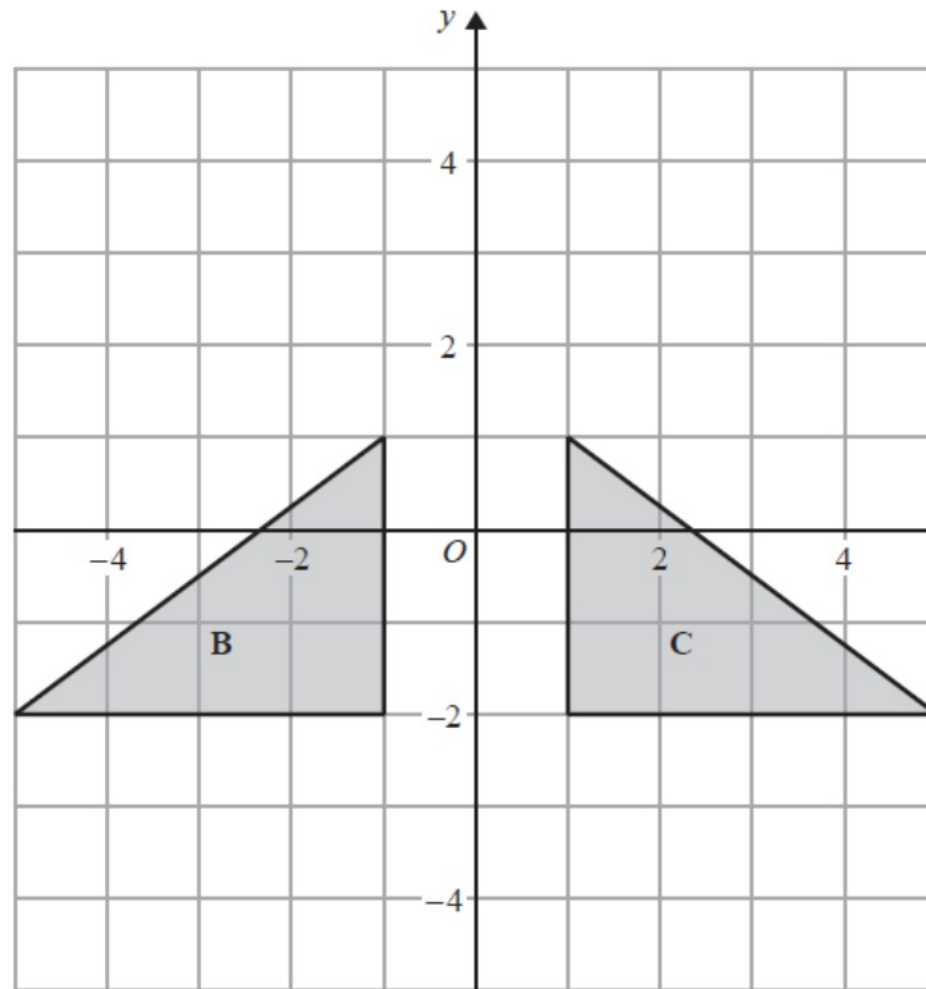


(b) Describe fully the single transformation that maps triangle **B** onto triangle **C**.



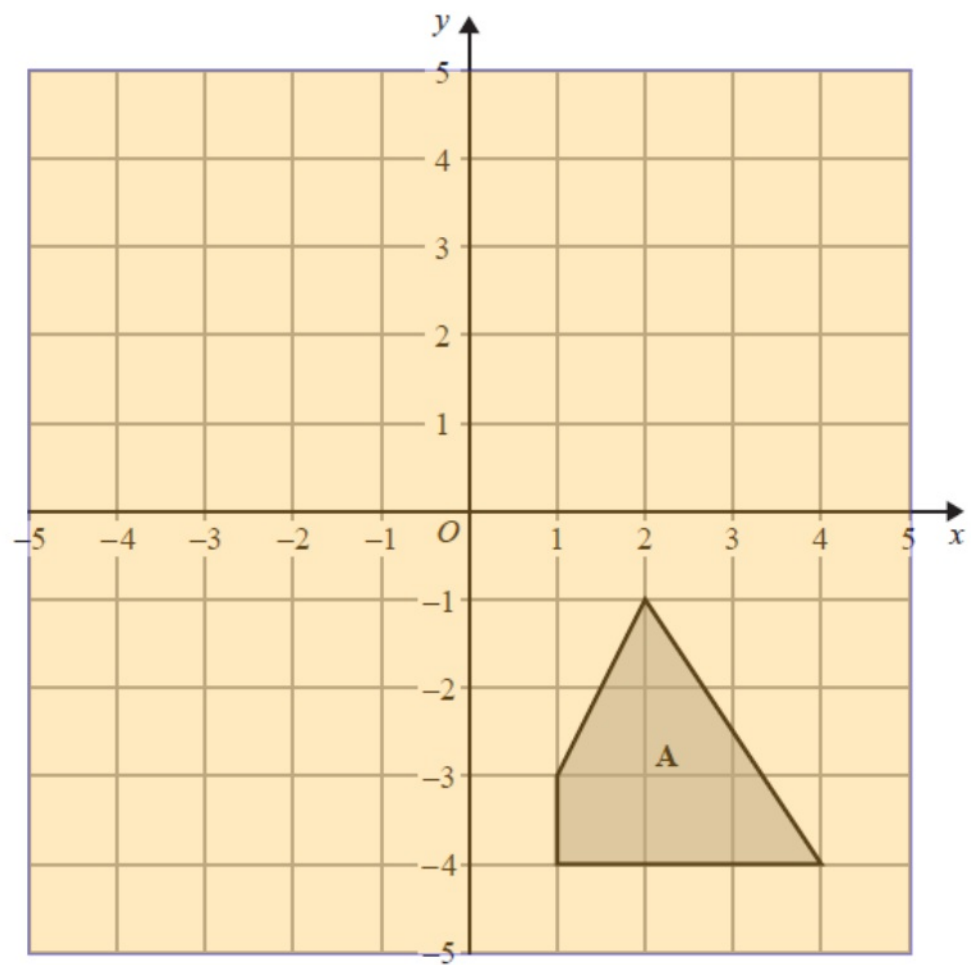
(a) Rotate shape A 90° clockwise about centre O .

Video created by W Neill

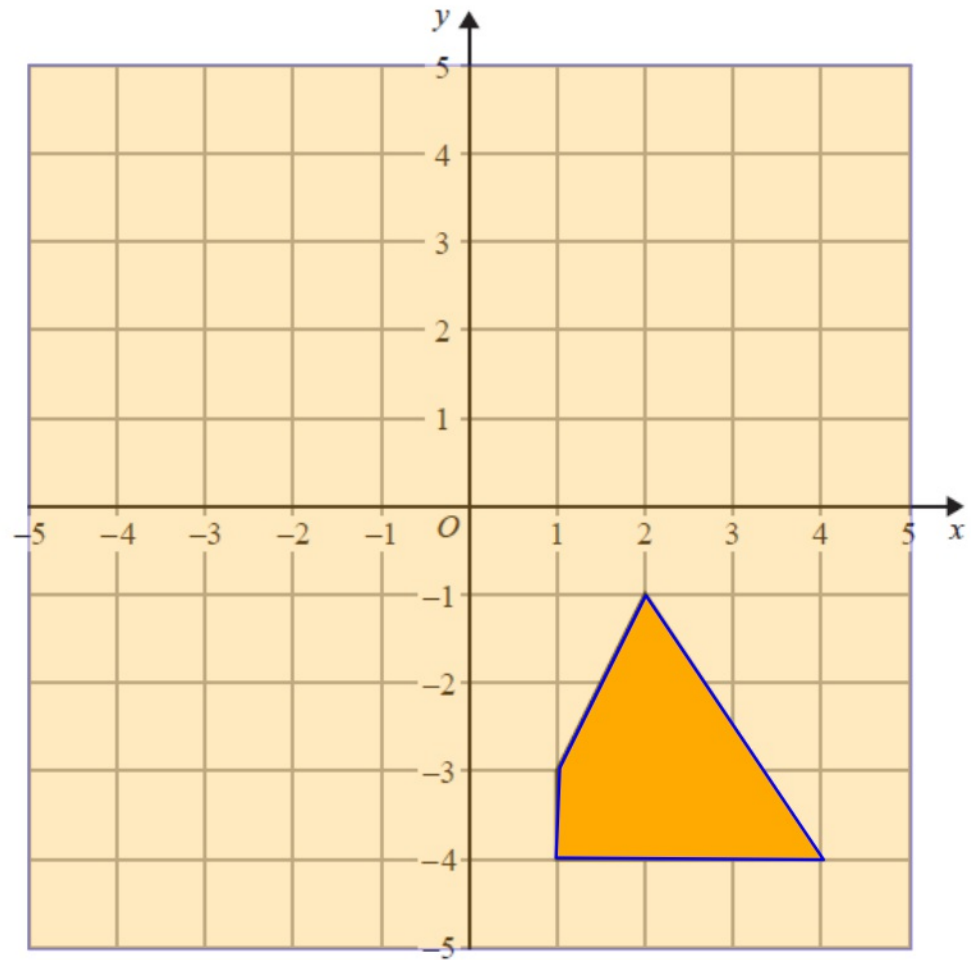


Reflection
through the
Y-axis
($x=0$)

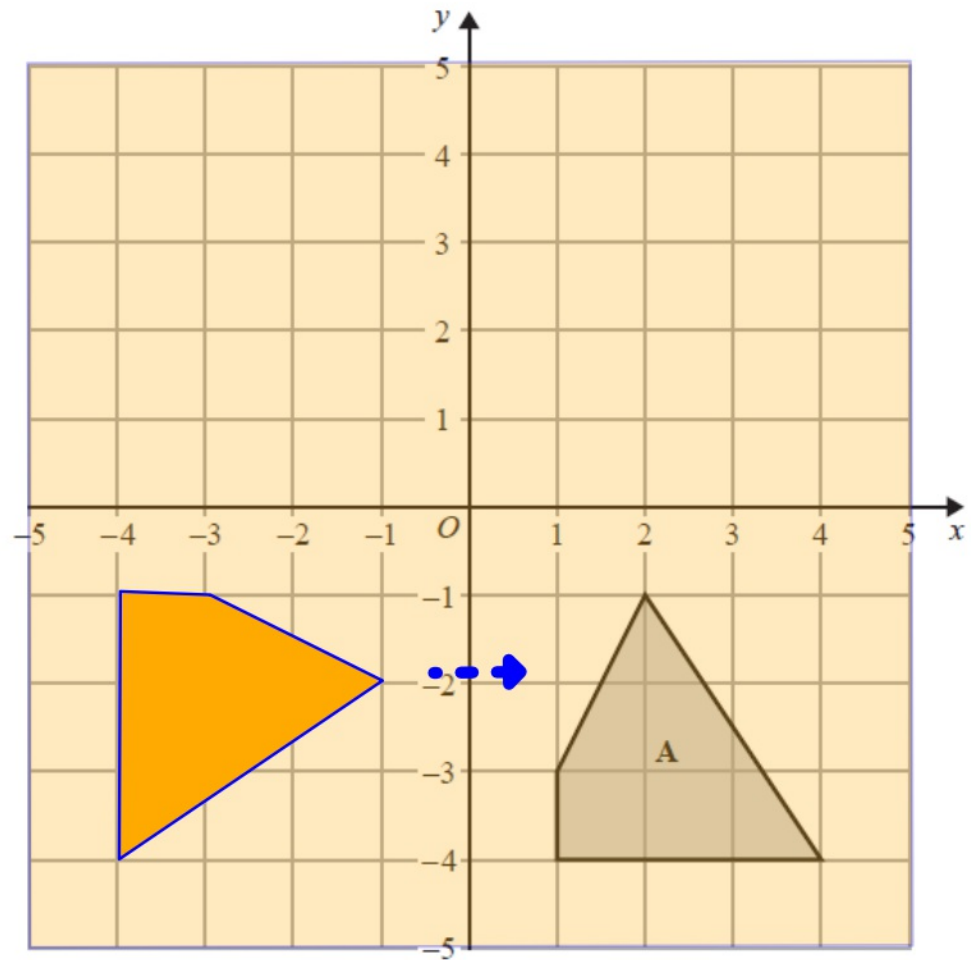
(b) Describe fully the single transformation that maps triangle **B** onto triangle **C**.



(a) Rotate shape A 90° clockwise about centre O .



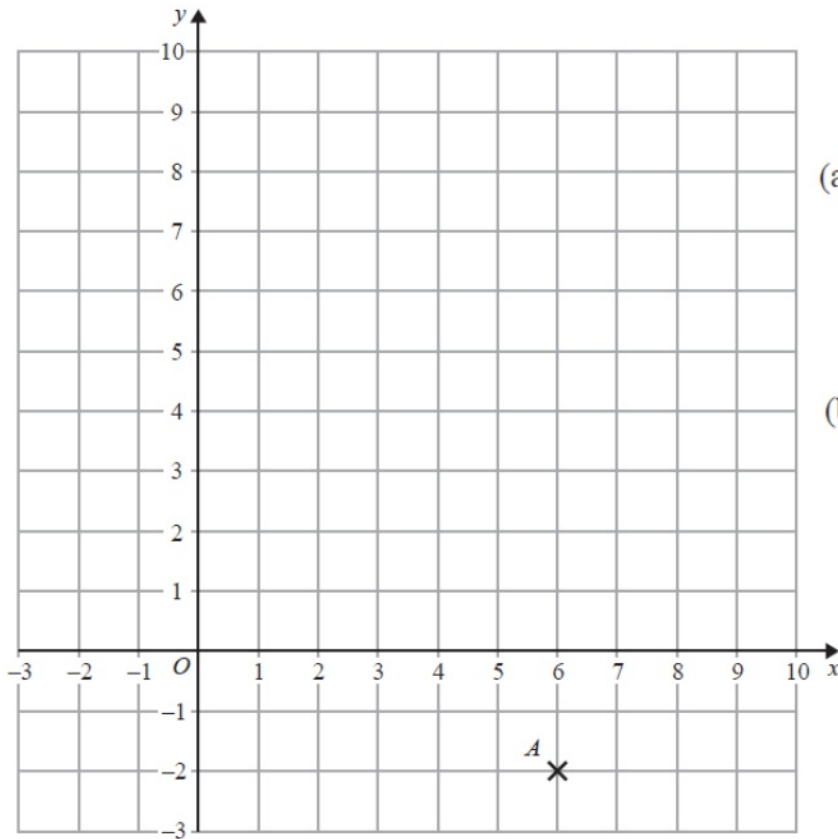
(a) Rotate shape A 90° clockwise about centre O .



(a) Rotate shape A 90° clockwise about centre O .

7

Created by W Neill



(a) Write down the coordinates of the point A .

(.....,)
(1)

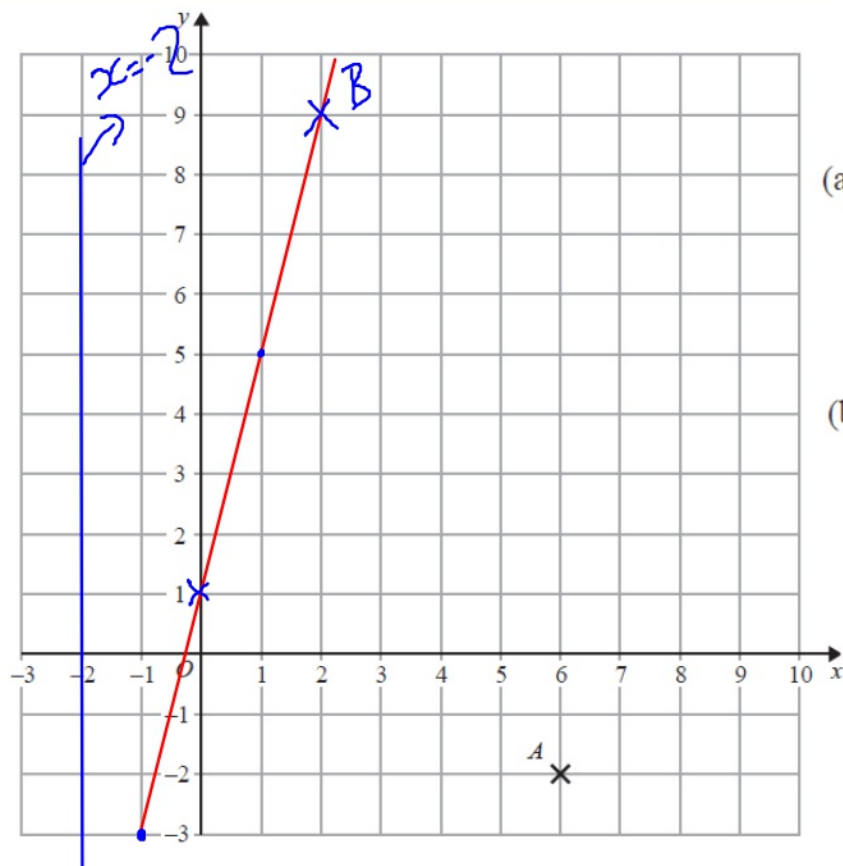
(b) (i) Plot the point with coordinates $(2, 9)$.
Label this point B .

(ii) Does point B lie on the straight line with equation $y = 4x + 1$?
You must show how you get your answer.

(c) On the grid, draw the line with equation $x = -2$

(Total for Question 7 is 4 marks)

7



$$y = 4x + 1$$

$$y = mx + c$$

Created by W Neill

$\frac{4}{1} = \frac{y}{x} = \text{gradient}$

(a) Write down the coordinates of the point A.

(6 , -2)
(1)

(b) (i) Plot the point with coordinates (2, 9).
Label this point B.

(ii) Does point B lie on the straight line with equation $y = 4x + 1$?
You must show how you get your answer.

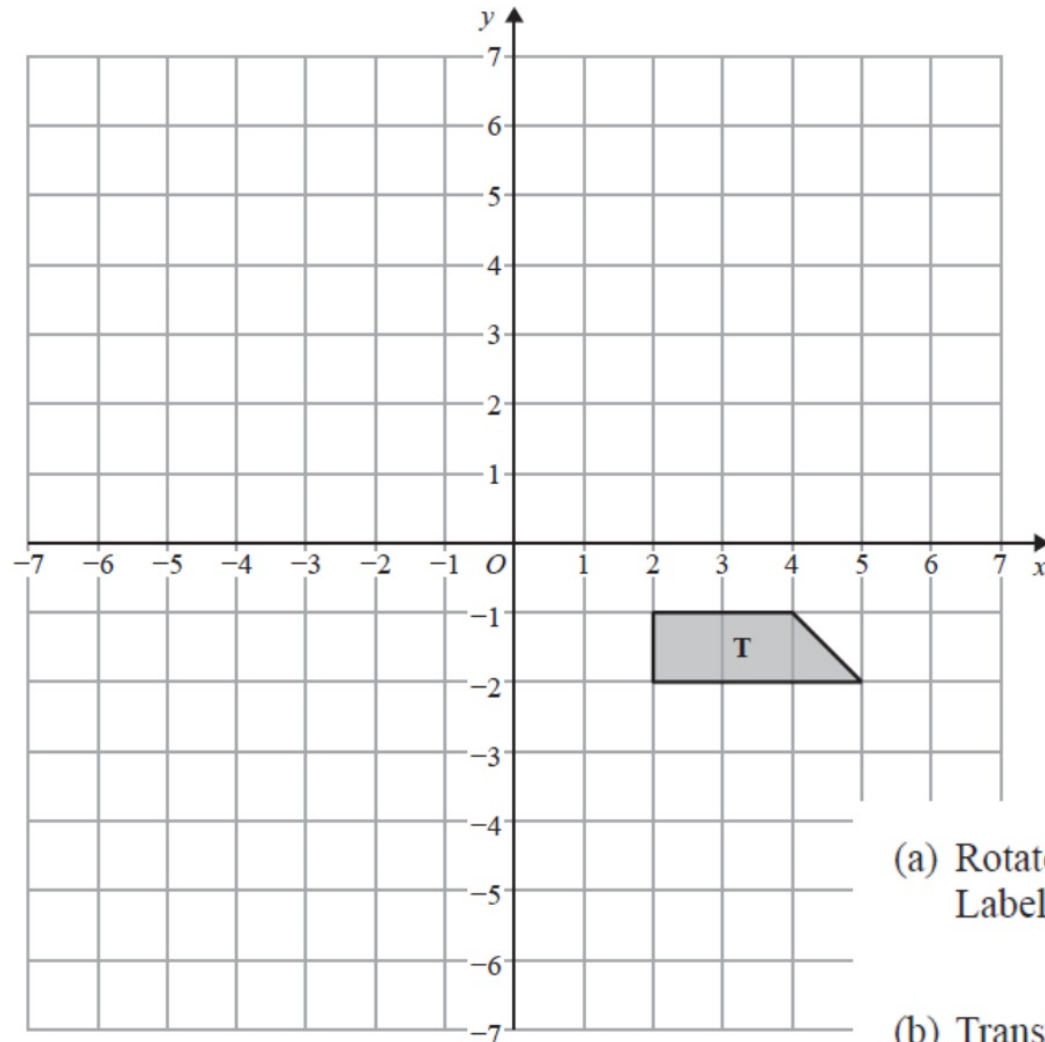
$$y = 4x + 1$$

$(2, 9)$

$9 = 8 + 1 \checkmark$ Yes it is on the line \checkmark

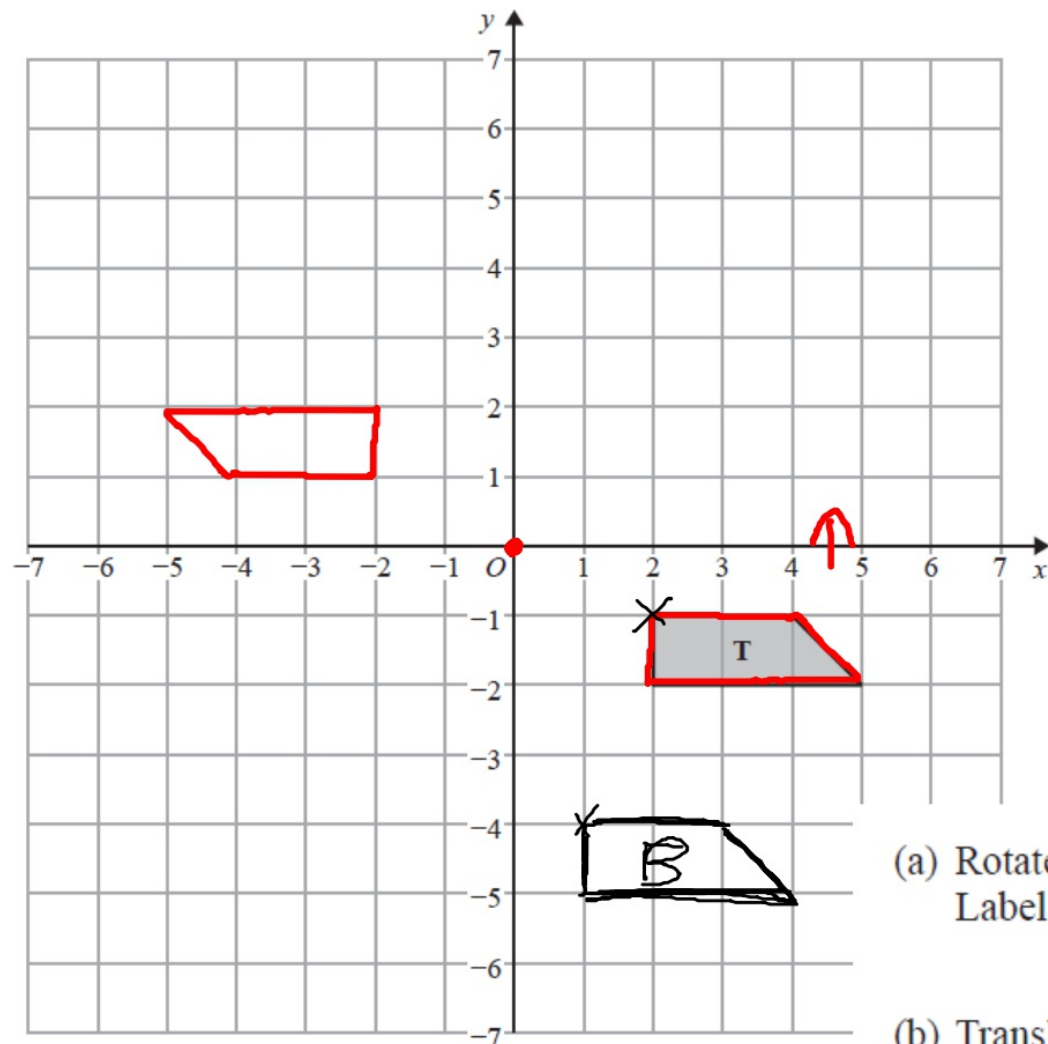
(c) On the grid, draw the line with equation $x = -2$

(Total for Question 7 is 4 marks)



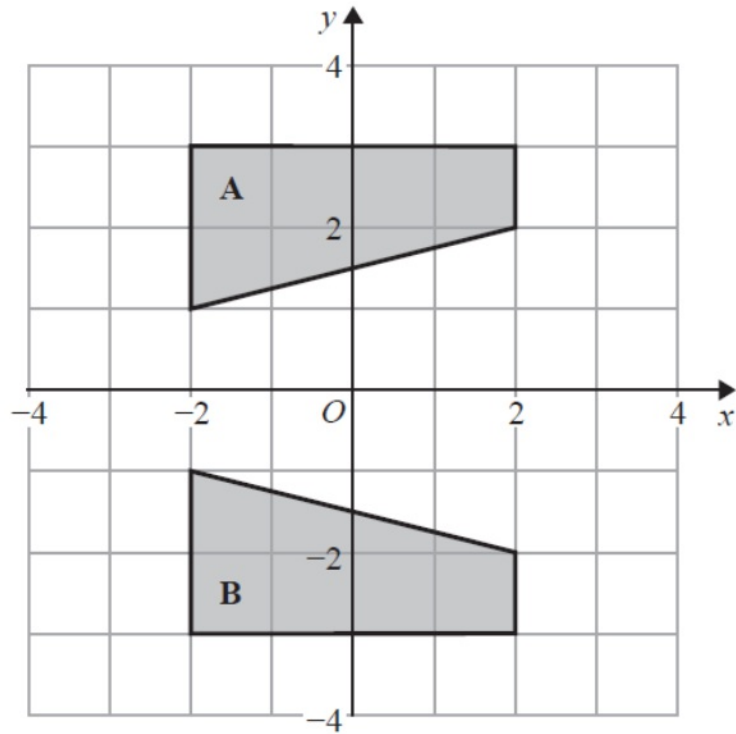
(a) Rotate trapezium **T** 180° about the origin.
Label the new trapezium **A**.

(b) Translate trapezium **T** by the vector $\begin{pmatrix} -1 \\ -3 \end{pmatrix}$.
Label the new trapezium **B**.



$$\begin{pmatrix} -1 \\ -3 \end{pmatrix} \begin{array}{l} \text{left } 1 \\ \text{down } 3 \end{array}$$

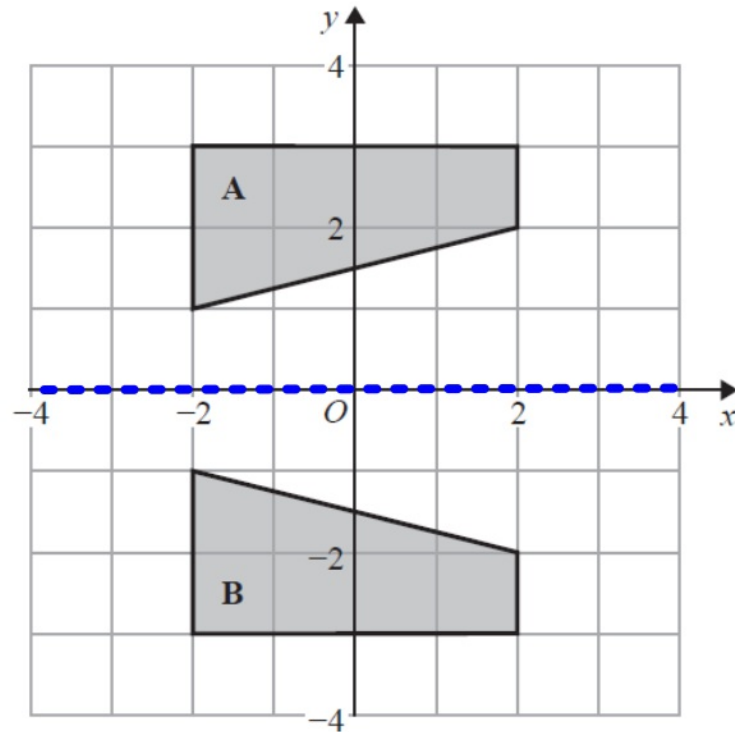
- (a) Rotate trapezium **T** 180° about the origin.
Label the new trapezium **A**.
- (b) Translate trapezium **T** by the vector $\begin{pmatrix} -1 \\ -3 \end{pmatrix}$
Label the new trapezium **B**.



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

.....

_____ (Total for Question 14 is 2 marks)



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

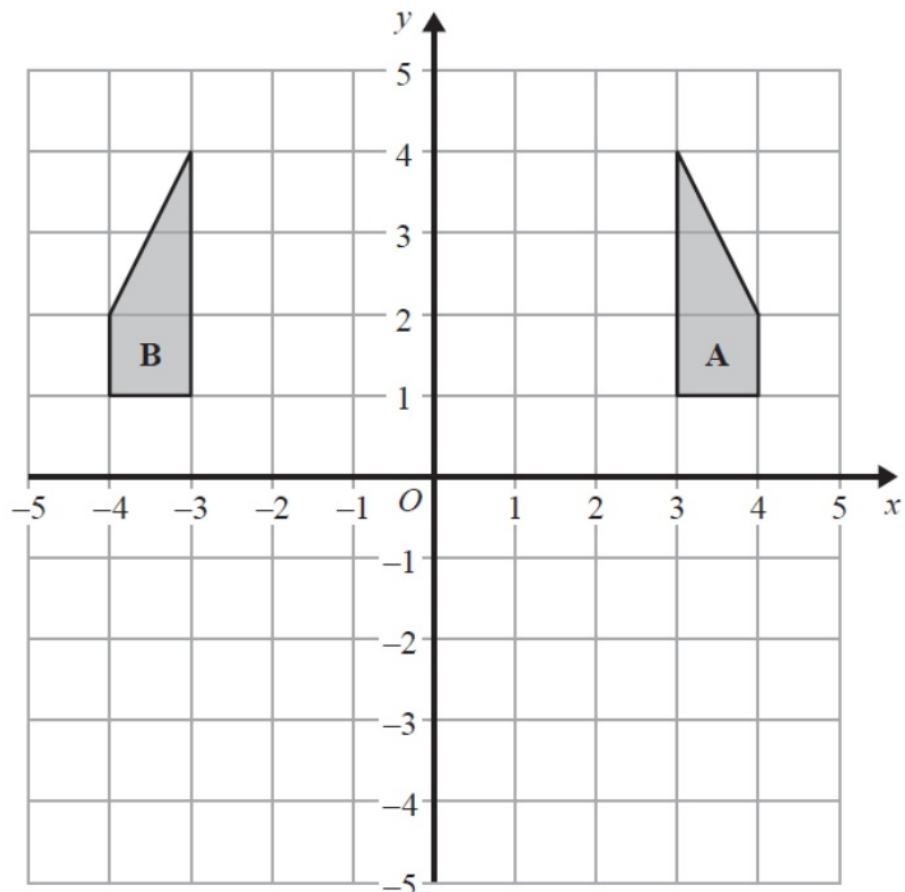
Reflection through x axis / or $Y=0$

(Total for Question 14 is 2 marks)

18

G39

Video created by W Neill



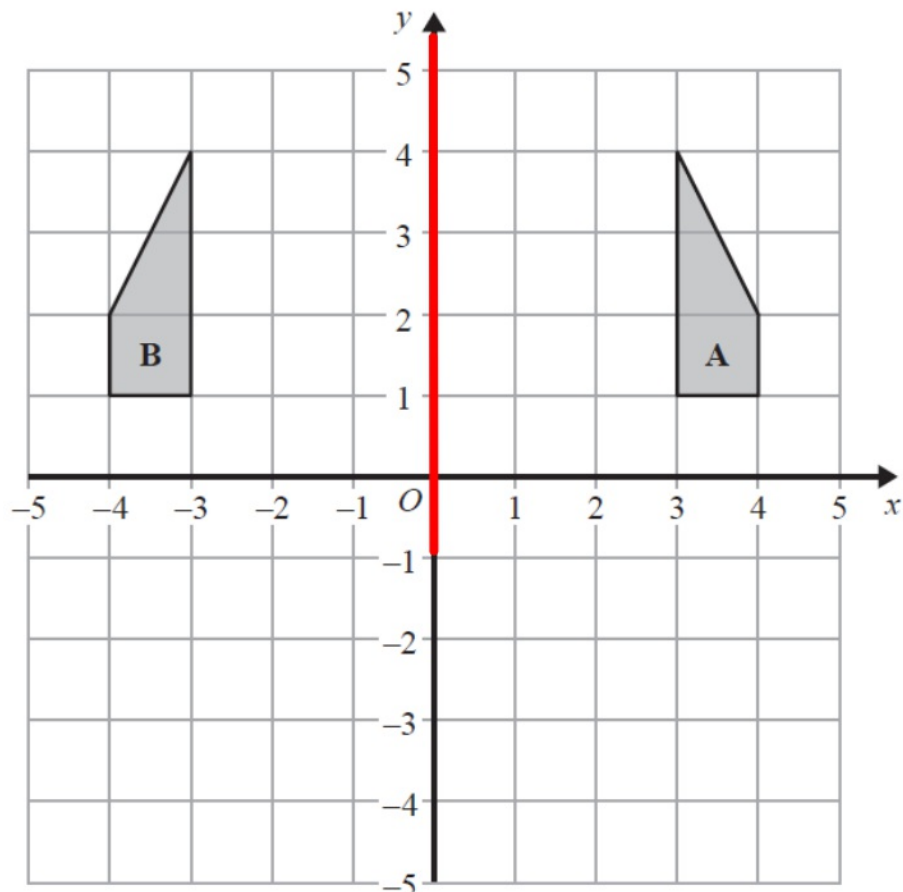
Describe fully the single transformation that maps shape A onto shape B.

(Total for Question 18 is 2 marks)

18

G39

Video created by W Neill



Reflection
through
 $x = 0$ ✓
(y axis) ✓

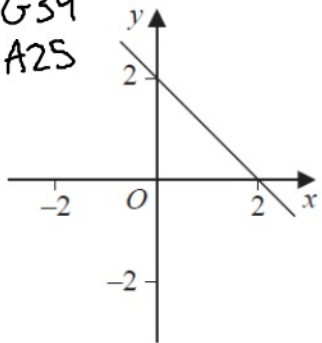
Describe fully the single transformation that maps shape A onto shape B.

(Total for Question 18 is 2 marks)

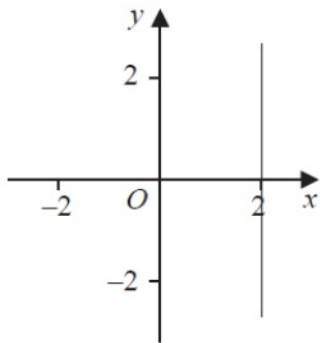
13 Here are six straight line graphs.

Video created by W Neill

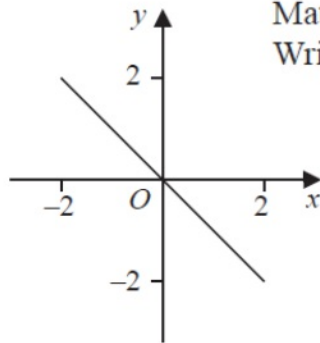
G39
A25



Graph A



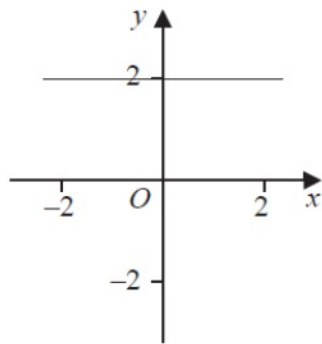
Graph B



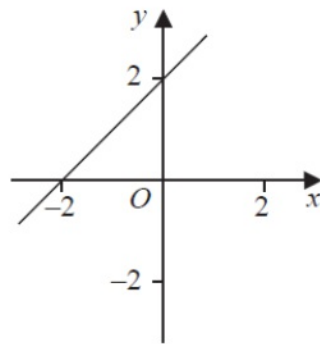
Graph C

Match each equation in the table to the correct graph.
Write the letter of the graph in the table.

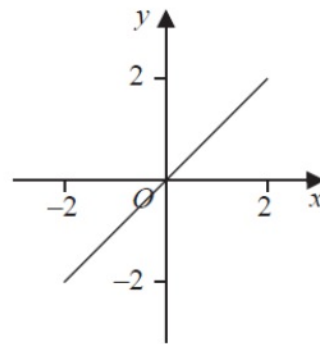
Equation	Graph
$y = 2$	
$y = x$	
$x + y = 2$	



Graph D



Graph E



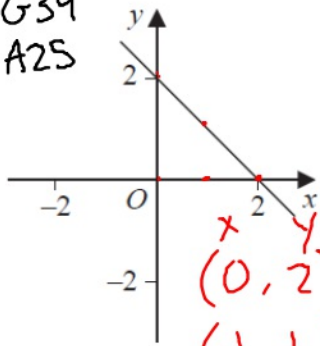
Graph F

(Total for Question 13 is 2 marks)

13 Here are six straight line graphs.

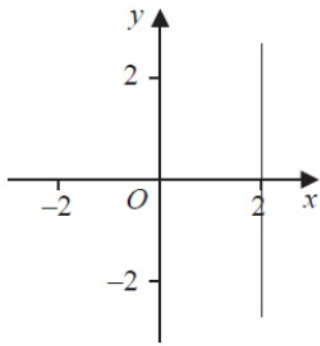
Video created by W Neill

G39
A25

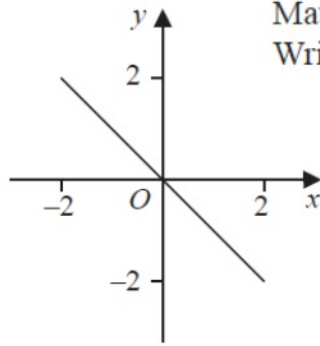


Graph A

x y
 $(0, 2)$
 $(1, 1)$
 $(2, 0)$



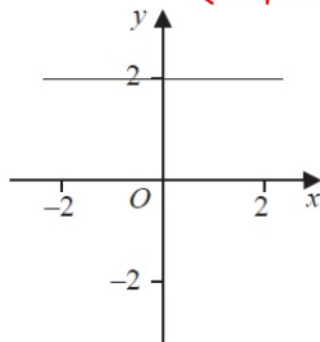
Graph B



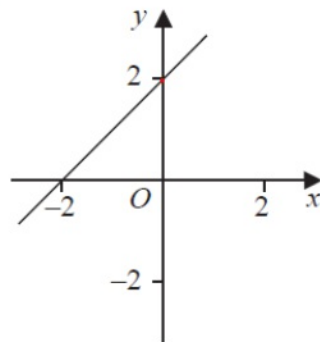
Graph C

Match each equation in the table to the correct graph.
Write the letter of the graph in the table.

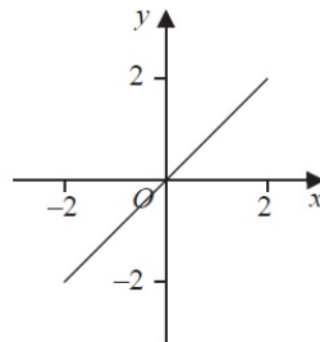
Equation	Graph
$y = 2$	D
$y = x$	F
$x + y = 2$	A



Graph D



Graph E



Graph F

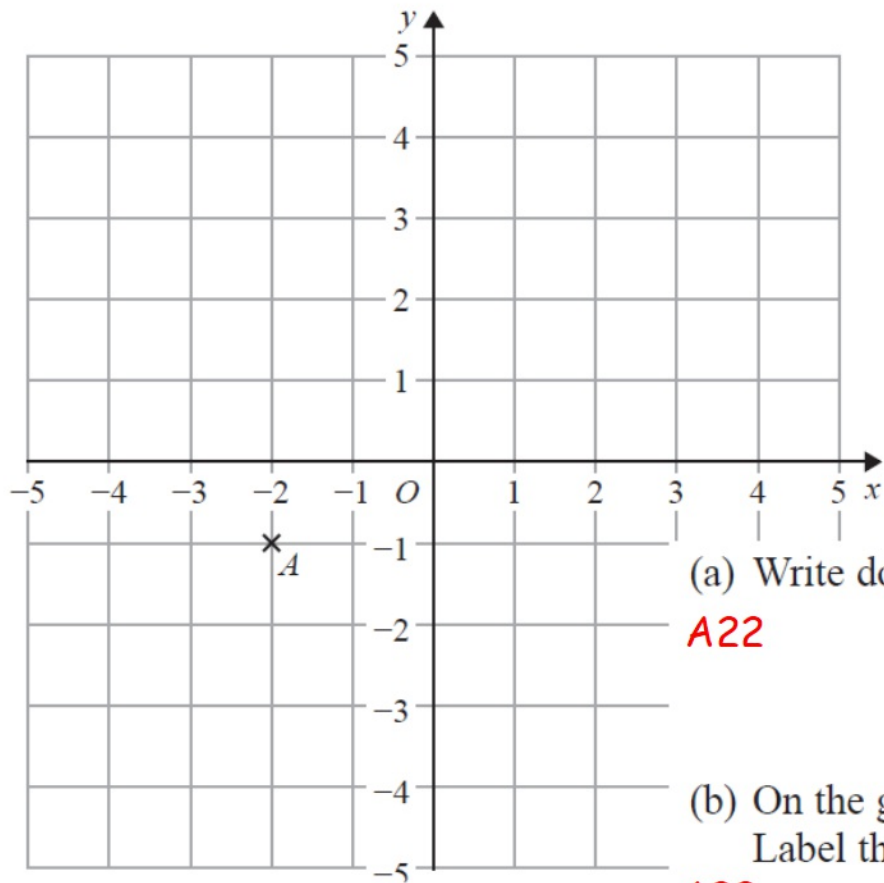
$$y = mx + c$$

$$y = -1x + 2$$

$$\equiv \underline{\underline{y\text{int}}}$$



(Total for Question 13 is 2 marks)



(a) Write down the coordinates of point A .

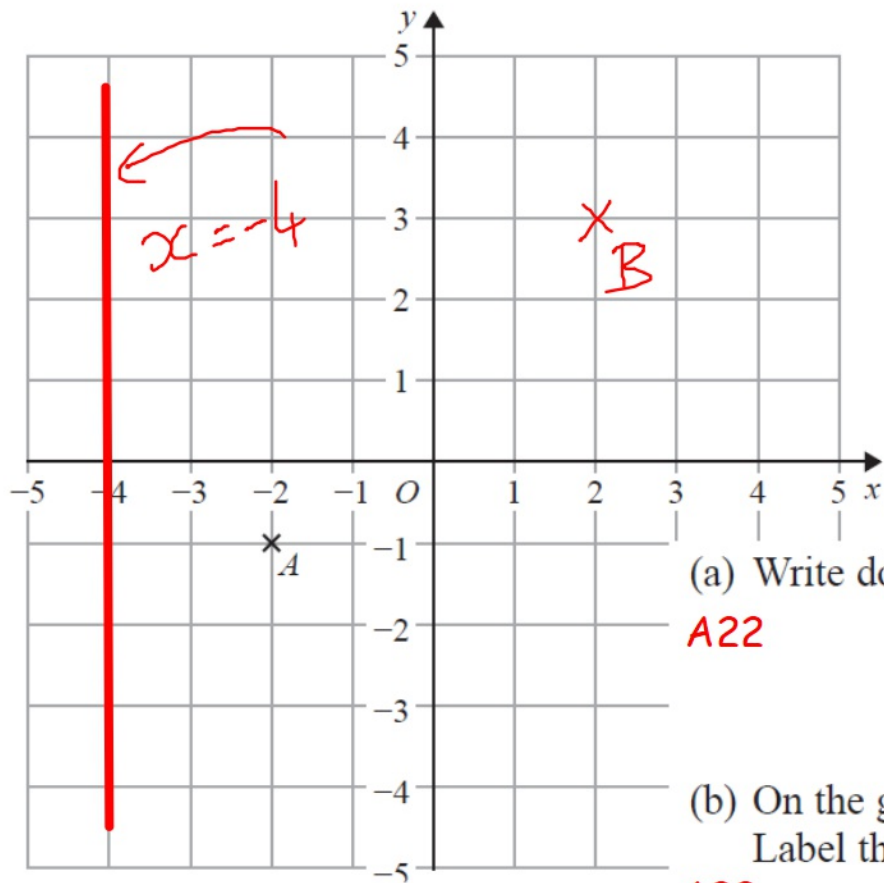
A22

(b) On the grid, mark with a cross (x) the point (2, 3)
Label this point B .

A22

(c) On the grid, draw the line with equation $x = -4$

G39



(a) Write down the coordinates of point A.

A22

$(-2, -1)$

(b) On the grid, mark with a cross (×) the point (2, 3)
Label this point B.

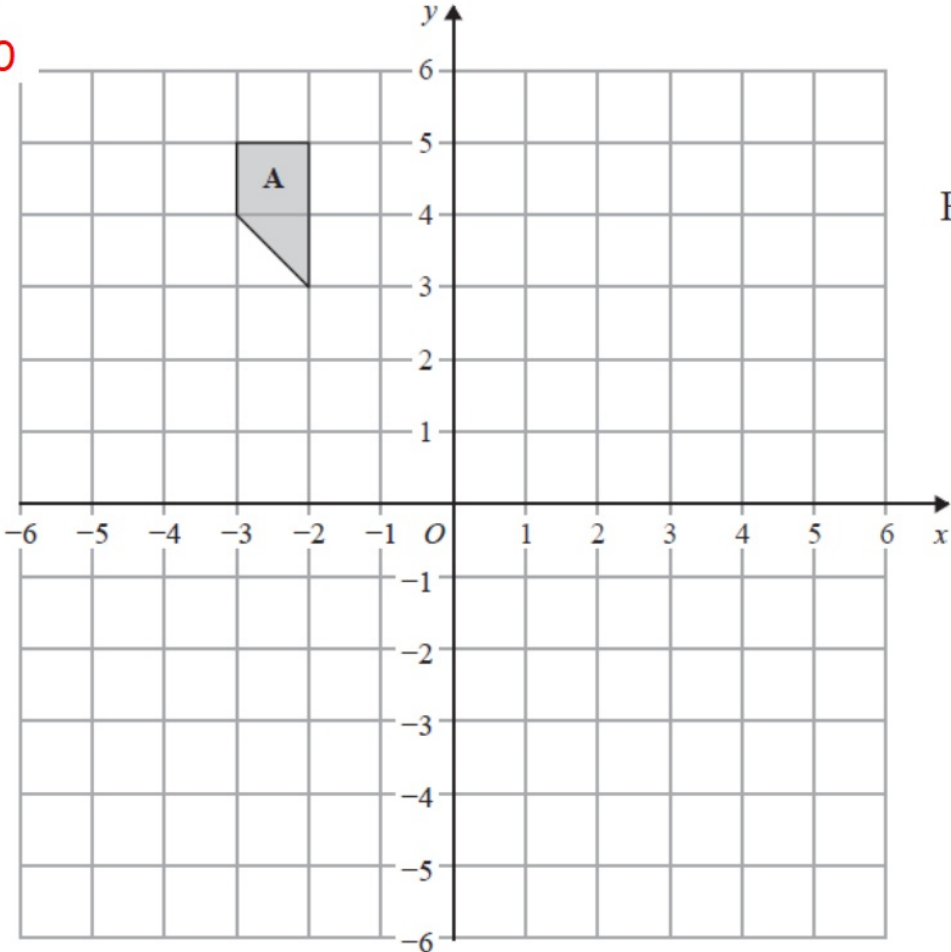
A22

(c) On the grid, draw the line with equation $x = -4$

G39

19

G40

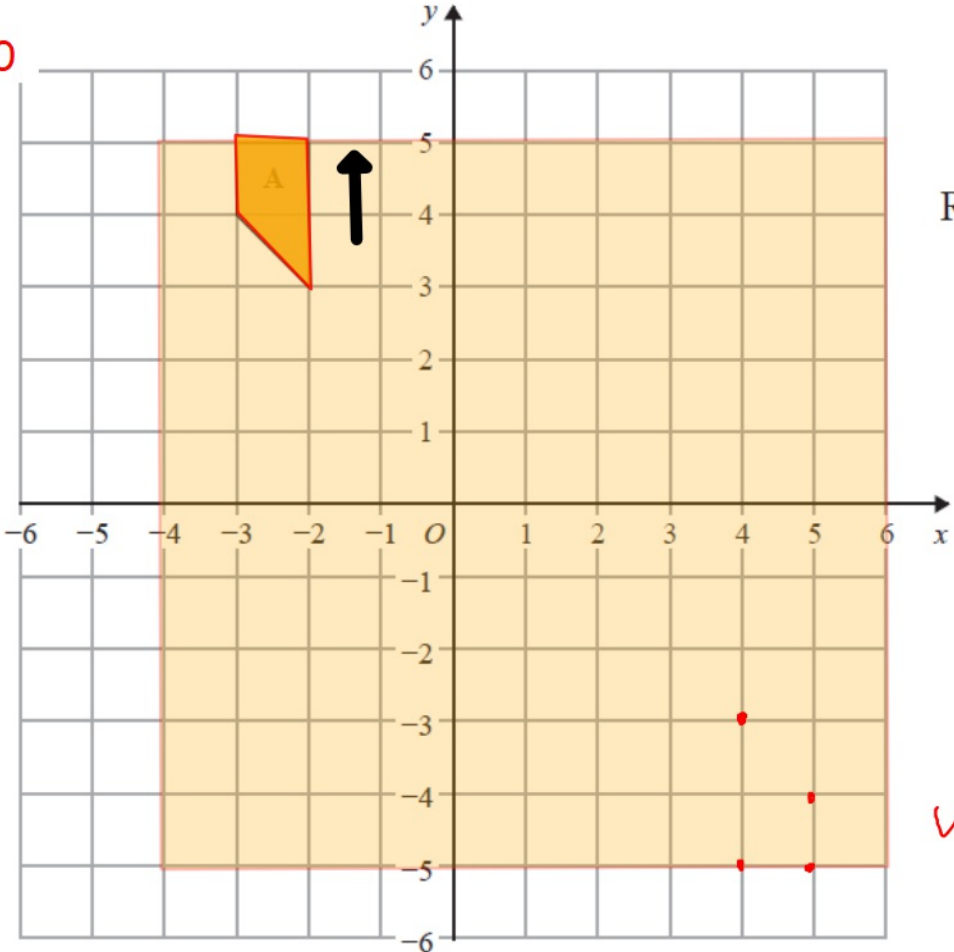


Rotate shape A 180° about (1, 0)

(Total for Question 19 is 2 marks)

19

G40



Rotate shape A 180° about (1, 0)

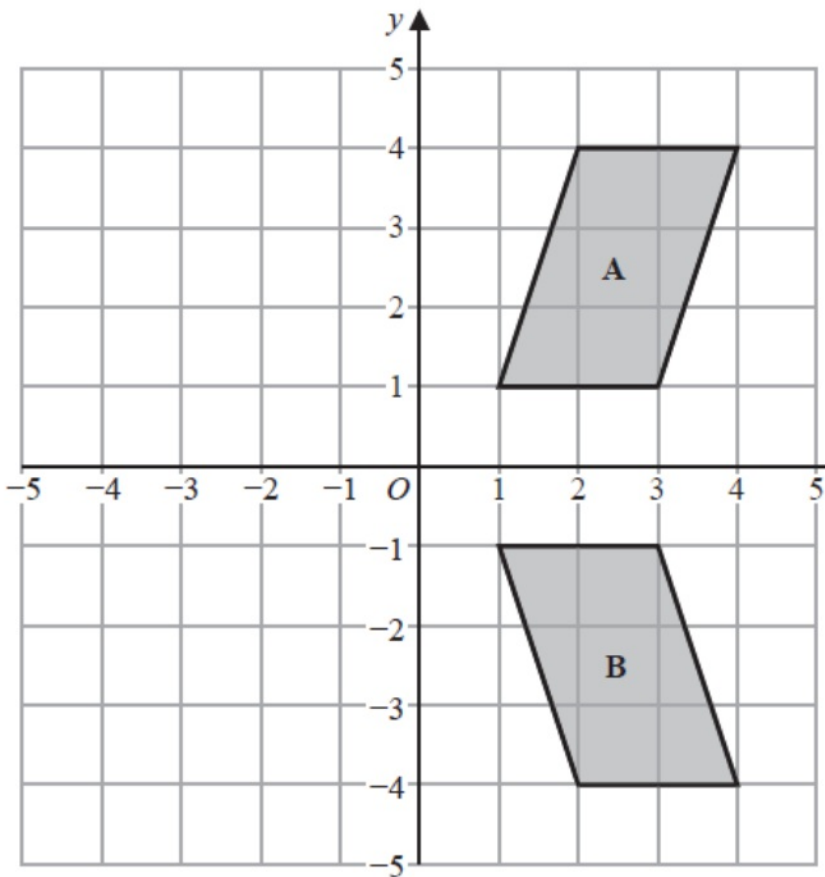


(Total for Question 19 is 2 marks)

16

G39

Video Created by W Neill



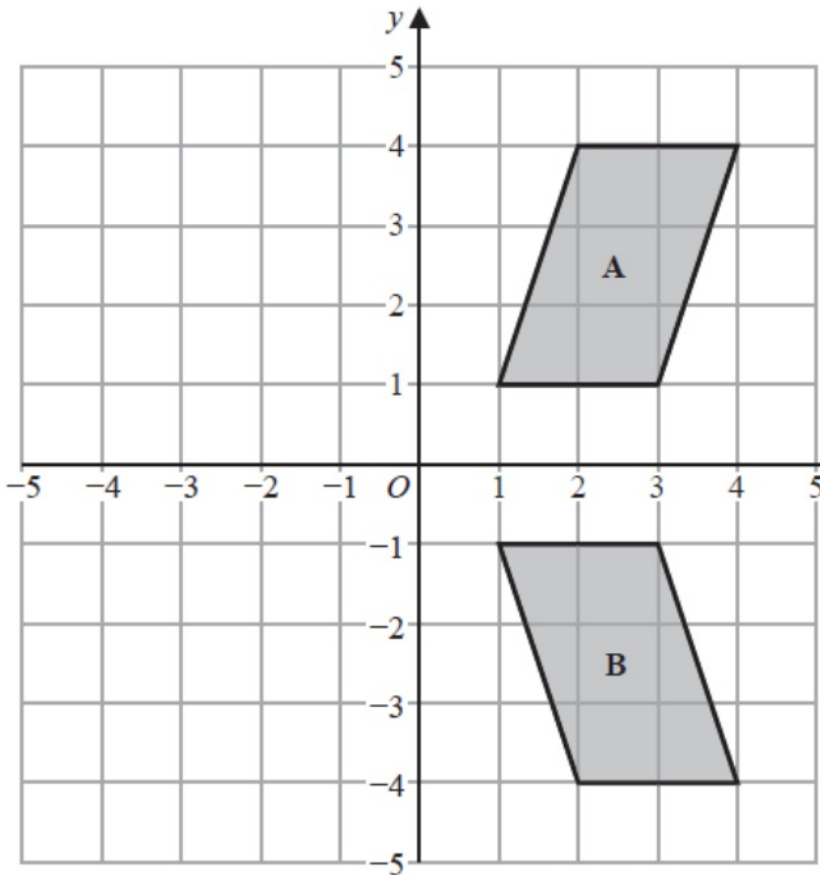
Describe fully the single transformation that maps shape A onto shape B.

(Total for Question 16 is 2 marks)

16

G39

Video Created by W Neill



Reflection ✓
through x -axis ✓
or through the
line $y=0$ ✓

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

(Total for Question 16 is 2 marks)

8 Shape **A** is translated by the vector $\begin{pmatrix} 4 \\ -7 \end{pmatrix}$ to make Shape **B**.

Shape **B** is then translated by the vector $\begin{pmatrix} -3 \\ -2 \end{pmatrix}$ to make Shape **C**.

Describe the single transformation that maps Shape **A** onto Shape **C**.

Video created by W Neill

(Total for Question 8 is 2 marks)

8 Shape A is translated by the vector $\begin{pmatrix} 4 \\ -7 \end{pmatrix}$ to make Shape B.

Video created by W Neill

Shape B is then translated by the vector $\begin{pmatrix} -3 \\ -2 \end{pmatrix}$ to make Shape C.

Describe the single transformation that maps Shape A onto Shape C.

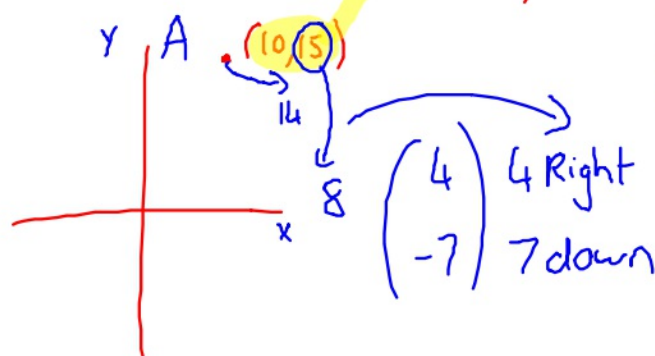
$$\begin{pmatrix} 4 \\ -7 \end{pmatrix} \begin{matrix} \text{Right/left} \\ \text{Up/Down} \end{matrix}$$

2 Translations

$$\begin{pmatrix} 4 \\ -7 \end{pmatrix} + \begin{pmatrix} -3 \\ -2 \end{pmatrix} = \begin{pmatrix} 1 \\ -9 \end{pmatrix}$$

Translation

Made up Co-ordinate $\begin{pmatrix} 10 \\ 15 \end{pmatrix}$



$$(B) = \begin{pmatrix} x & y \\ 14 & 8 \\ \leftarrow & \downarrow \\ & 6 \end{pmatrix}$$

$$\begin{pmatrix} -3 \\ -2 \end{pmatrix} \begin{matrix} \text{left 3} \\ \text{down 2} \end{matrix}$$

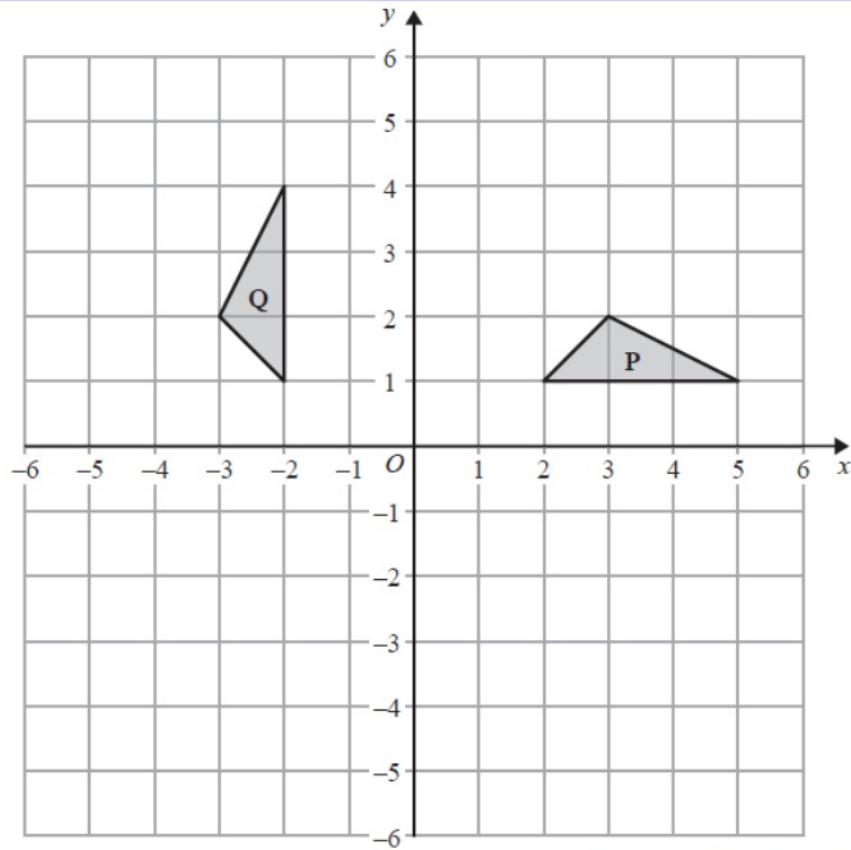
$$(C) \begin{pmatrix} 11 \\ 6 \end{pmatrix}$$

Translation. $\begin{pmatrix} 1 \\ -9 \end{pmatrix}$ Right 1 down 9

(Total for Question 8 is 2 marks)

2

Created by W Neill



Describe fully the single transformation that maps triangle P onto triangle Q.

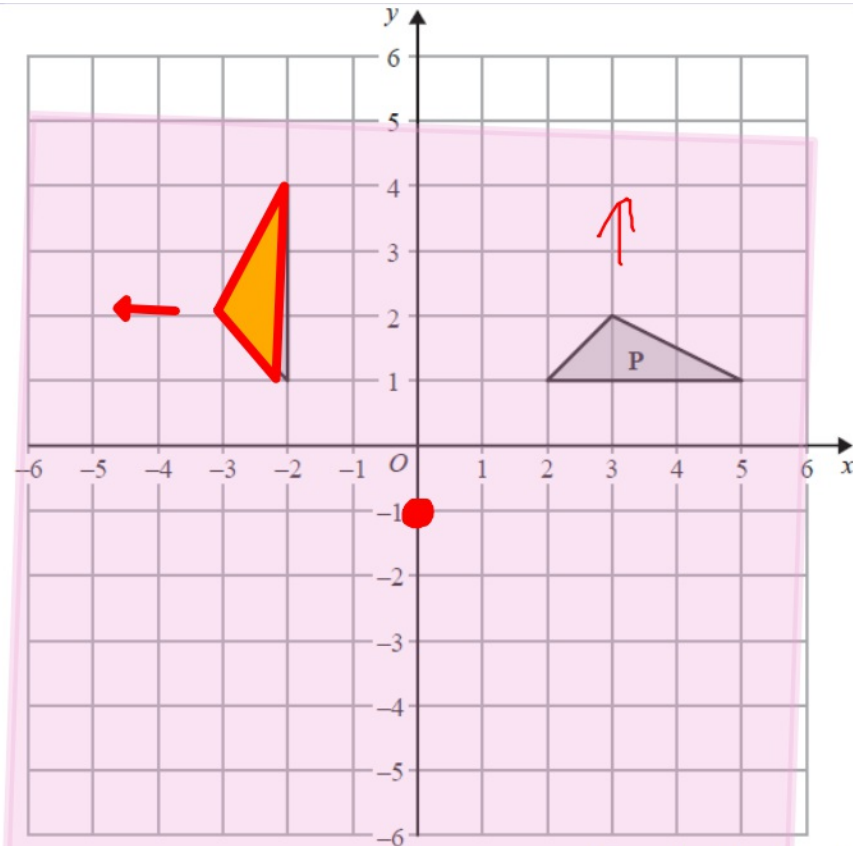
.....

.....

(Total for Question 24 is 2 marks)

2

Created by W Neill

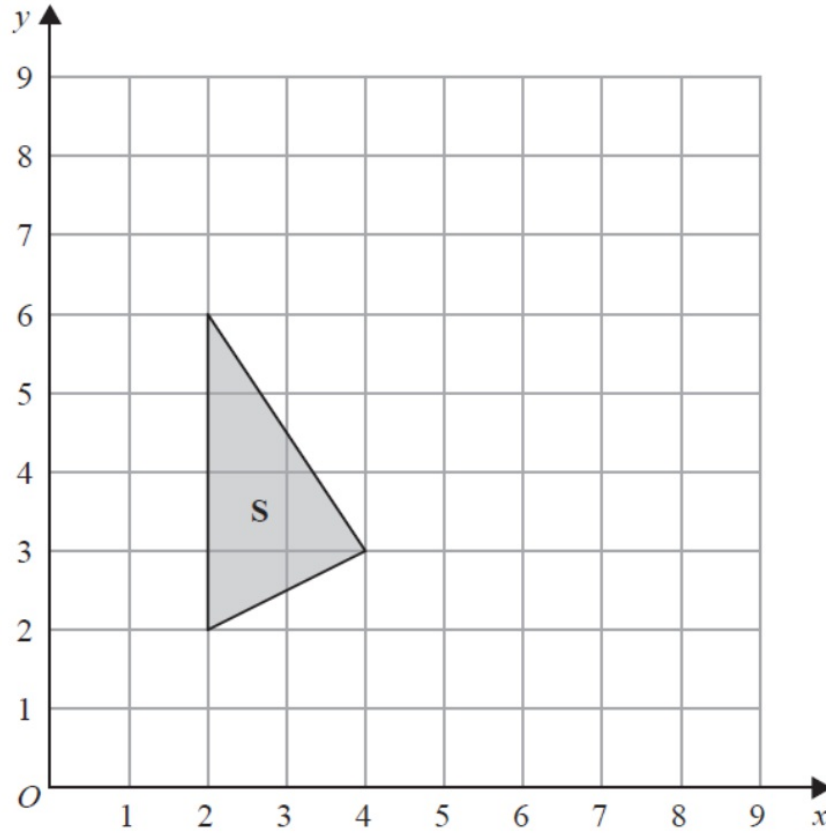


Rotated
from $(0, -1)$
 90°
anti-clockwise ✓

Describe fully the single transformation that maps triangle P onto triangle Q.

(Total for Question 24 is 2 marks)

2



Created by W Neill

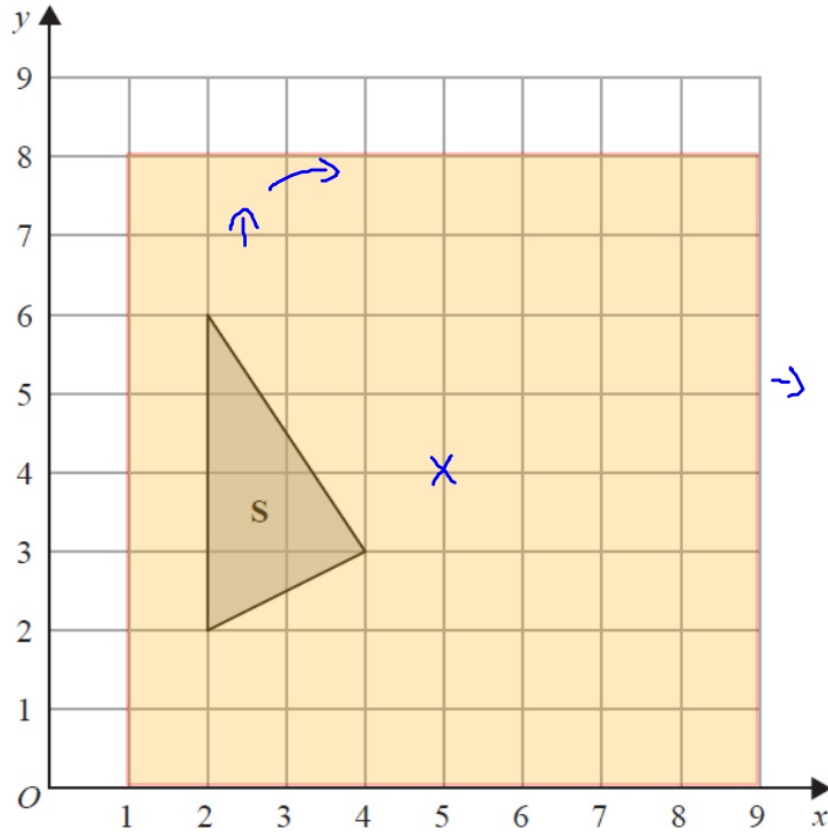
- (a) Rotate shape **S** 90° clockwise, centre (5, 4)
Label your image **T**.

(2)

- (b) Describe fully the single transformation that will map shape **T** onto shape **S**.

.....
(1)

2



Created by W Neill

- (a) Rotate shape **S** 90° clockwise, centre $(5, 4)$
Label your image **T**.

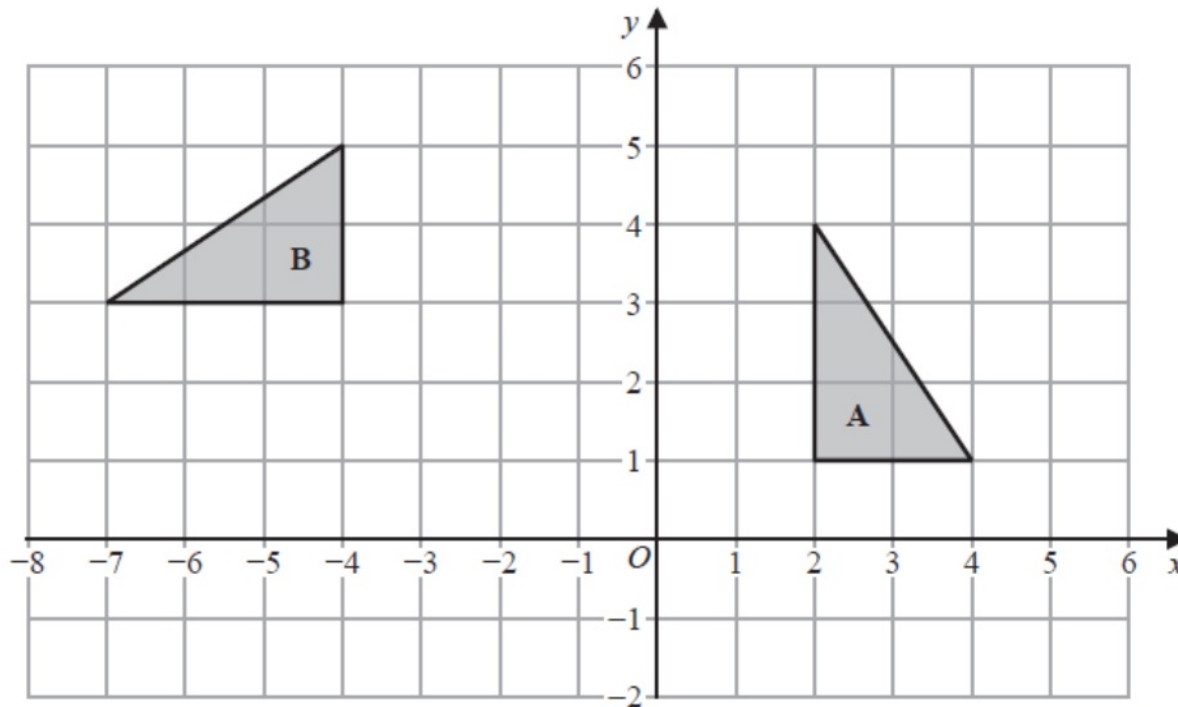
(2)

- (b) Describe fully the single transformation that will map shape **T** onto shape **S**.

.....
(1)

4

G40



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

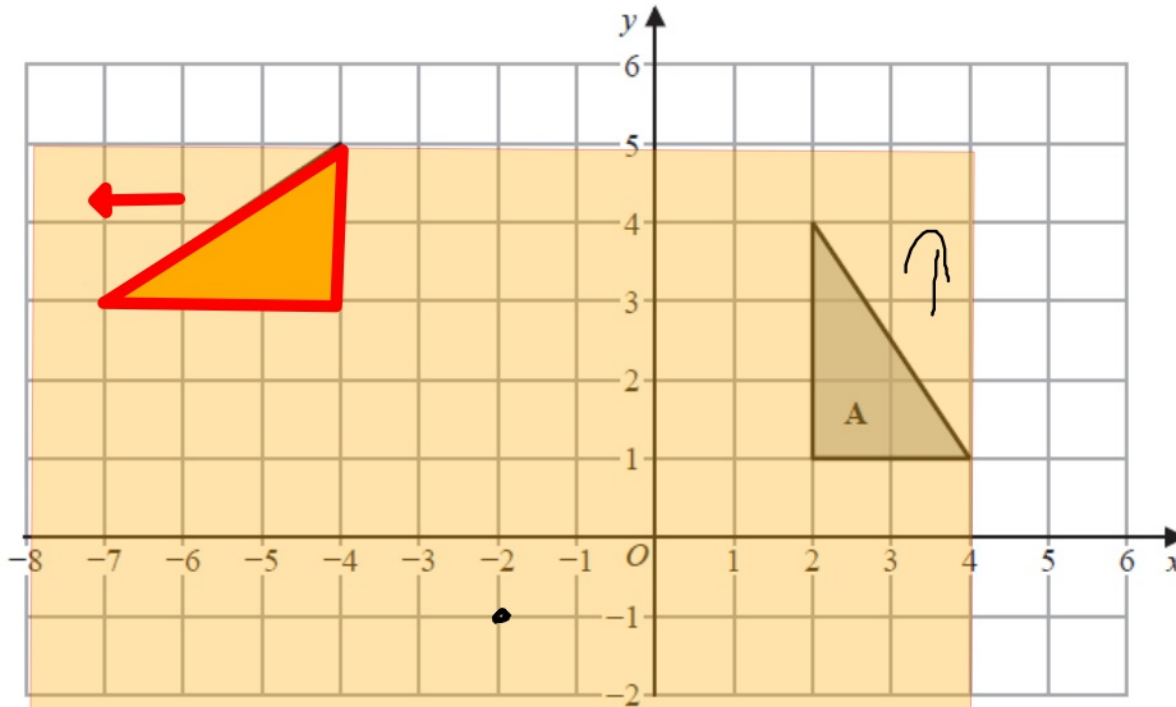
.....

.....

(Total for Question is 2 marks)

4

G40



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

Rotation, 90 acw from $(-2, -1)$

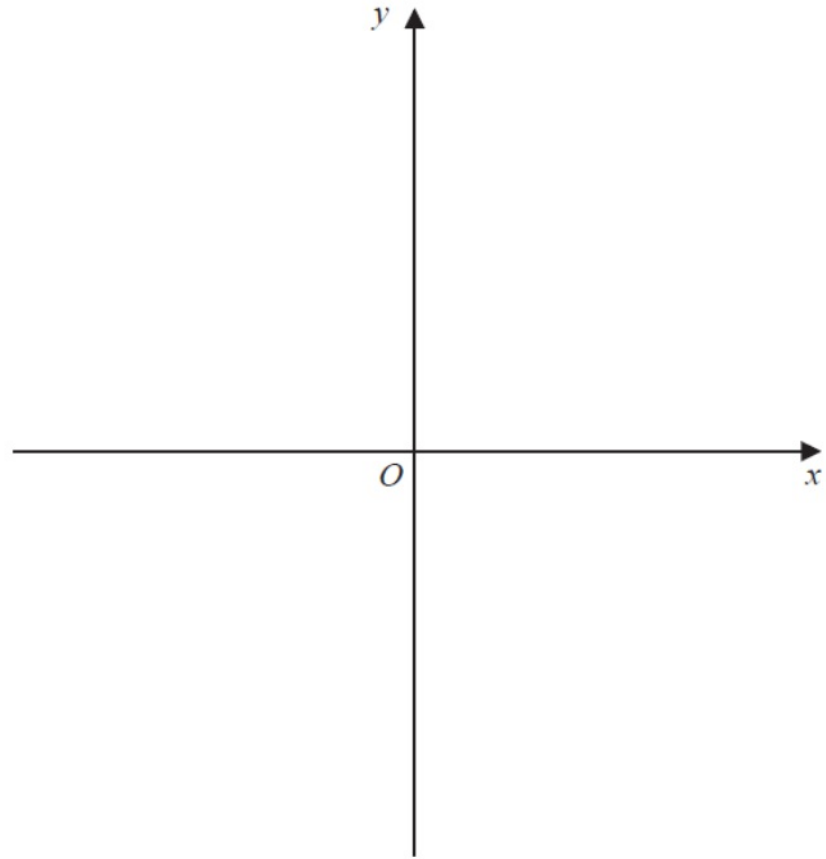
(Total for Question is 2 marks)

16 The graph of $y = x^2$ is reflected in the line with equation $y = x$ to give the curve **C**.

- (a) Sketch the graph of $y = x^2$ and the curve **C**.
Clearly label the graphs.

A79

G39

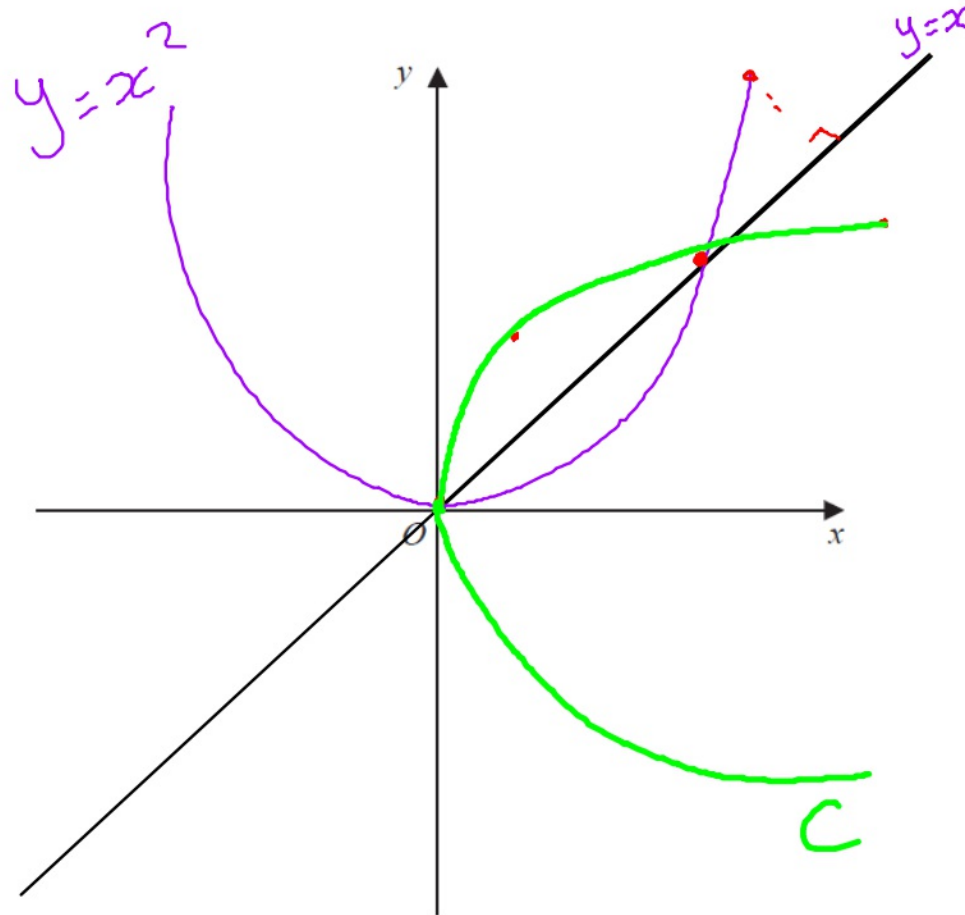


16 The graph of $y = x^2$ is reflected in the line with equation $y = x$ to give the curve **C**.

- (a) Sketch the graph of $y = x^2$ and the curve **C**.
Clearly label the graphs.

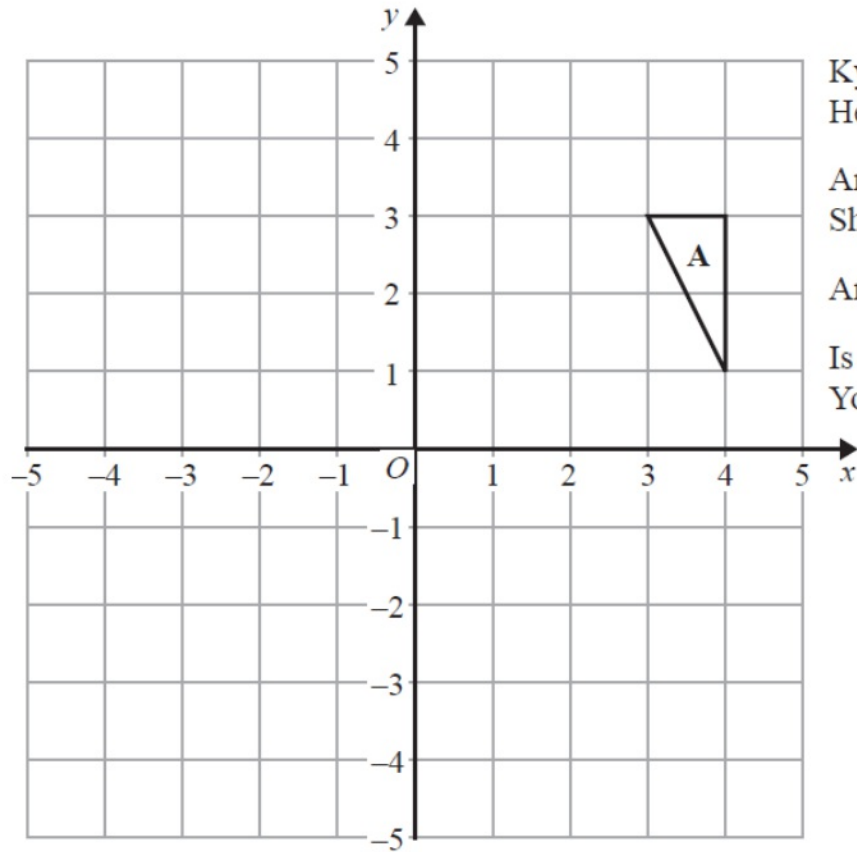
A79

G39



9 The diagram shows triangle **A** drawn on a grid.

Video created by W Neill



Kyle reflects triangle **A** in the x -axis to get triangle **B**.
He then reflects triangle **B** in the line $y = x$ to get triangle **C**.

Amy reflects triangle **A** in the line $y = x$ to get triangle **D**.
She is then going to reflect triangle **D** in the x -axis to get triangle **E**.

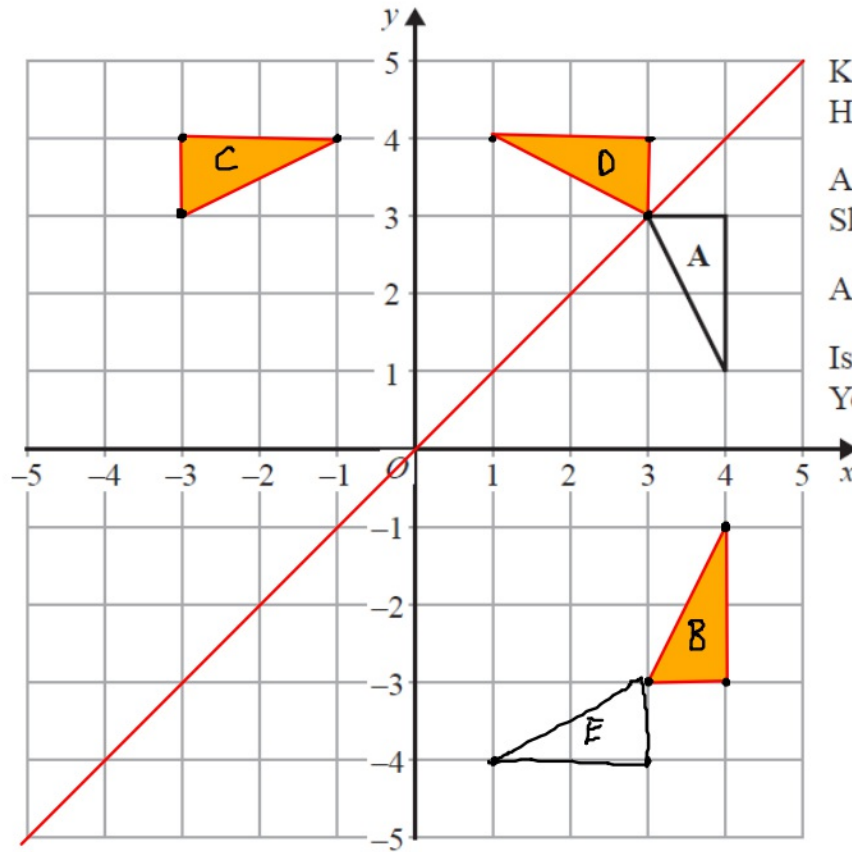
Amy says that triangle **E** should be in the same position as triangle **C**.

Is Amy correct?
You must show how you get your answer.

(Total for Question 9 is 3 marks)

9 The diagram shows triangle A drawn on a grid.

Video created by W Neill



Kyle reflects triangle A in the x -axis to get triangle B.
He then reflects triangle B in the line $y = x$ to get triangle C.

Amy reflects triangle A in the line $y = x$ to get triangle D.
She is then going to reflect triangle D in the x -axis to get triangle E.

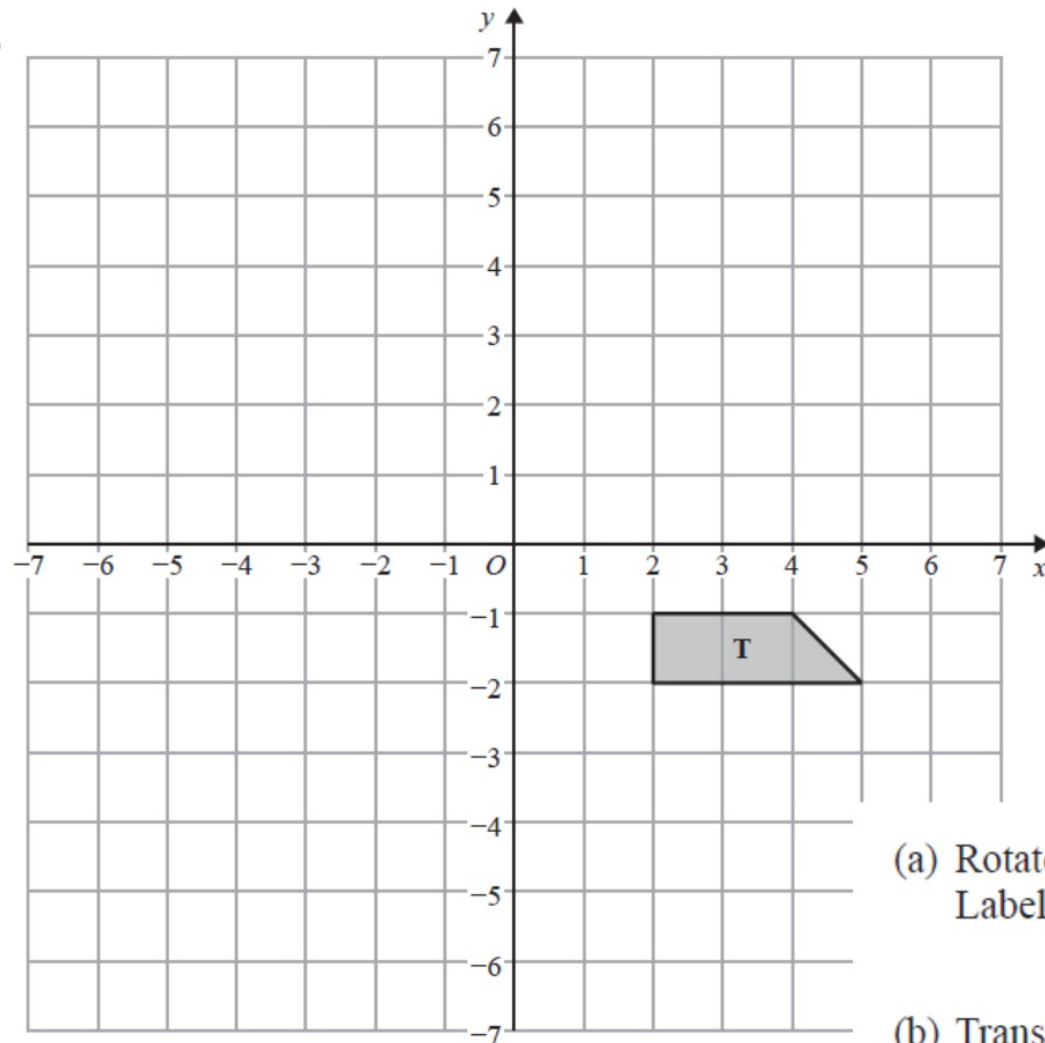
Amy says that triangle E should be in the same position as triangle C.

Is Amy correct?
You must show how you get your answer.

No, amy is not correct.
See Diagram.

(Total for Question 9 is 3 marks)

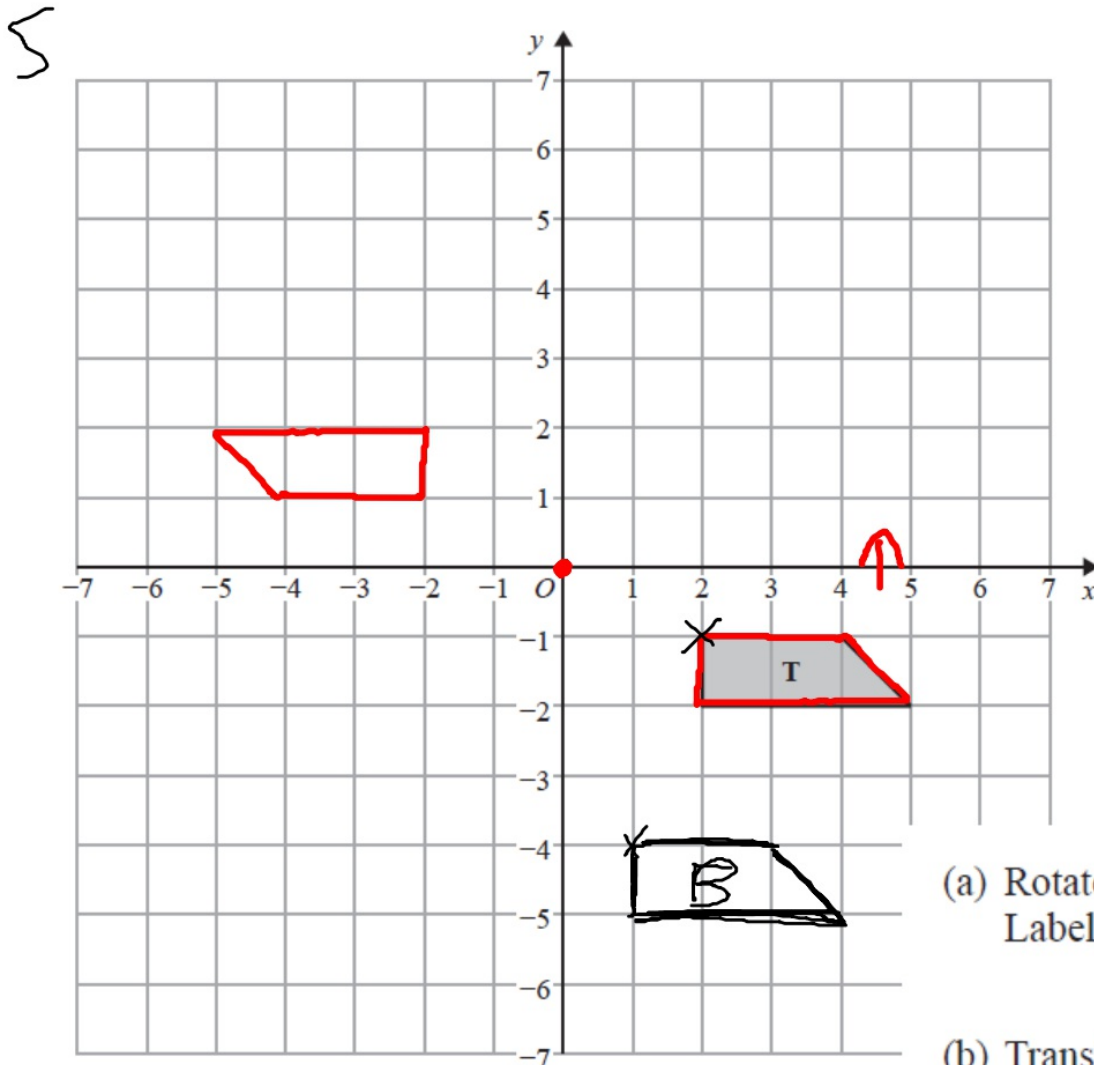
5



(a) Rotate trapezium **T** 180° about the origin.
Label the new trapezium **A**.

(b) Translate trapezium **T** by the vector $\begin{pmatrix} -1 \\ -3 \end{pmatrix}$
Label the new trapezium **B**.

Created by W Neill



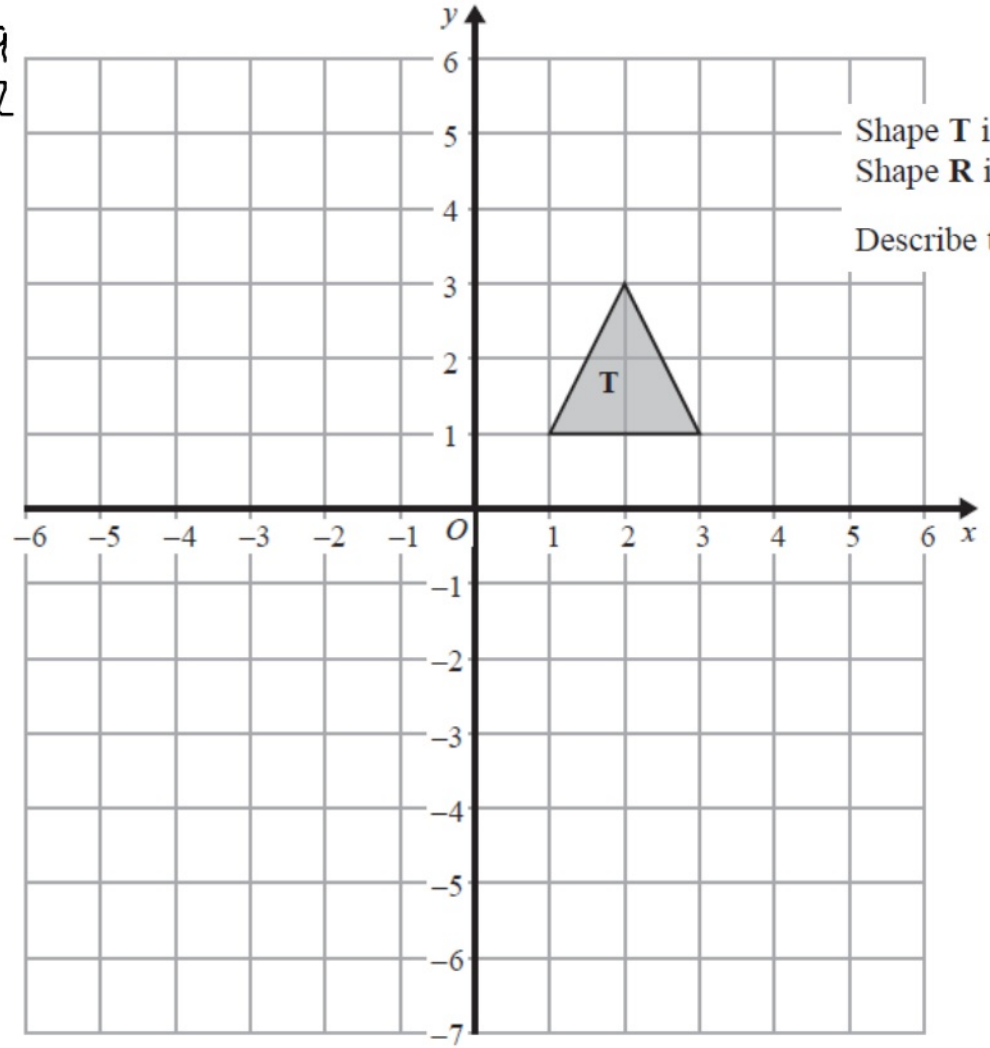
$$\begin{pmatrix} -1 \\ -3 \end{pmatrix} \begin{array}{l} \text{left } 1 \\ \text{down } 3 \end{array}$$

(a) Rotate trapezium T 180° about the origin.
Label the new trapezium A.

(b) Translate trapezium T by the vector $\begin{pmatrix} -1 \\ -3 \end{pmatrix}$
Label the new trapezium B.

7
G39
G42

Video created by W Neill

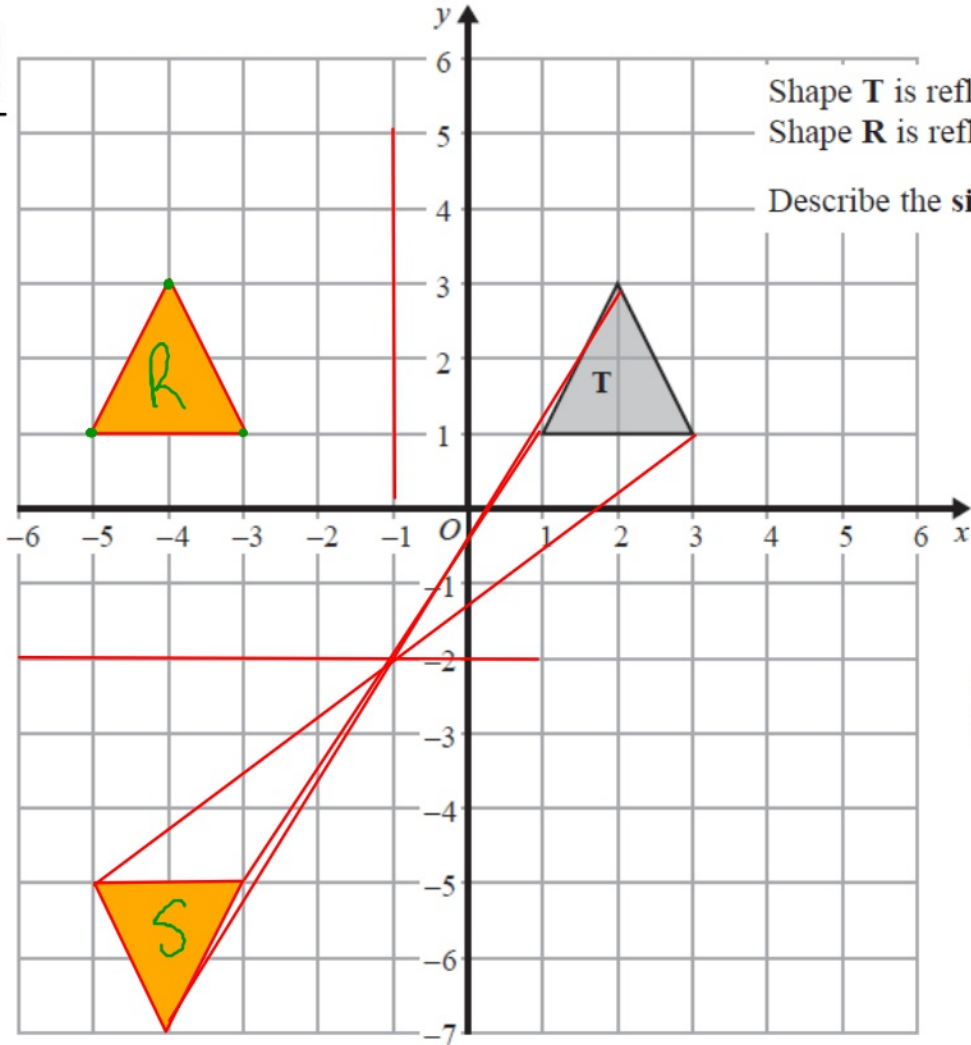


Shape **T** is reflected in the line $x = -1$ to give shape **R**.
Shape **R** is reflected in the line $y = -2$ to give shape **S**.

Describe the **single** transformation that will map shape **T** to shape **S**.

(Total for Question 7 is 2 marks)

7
G39
G42

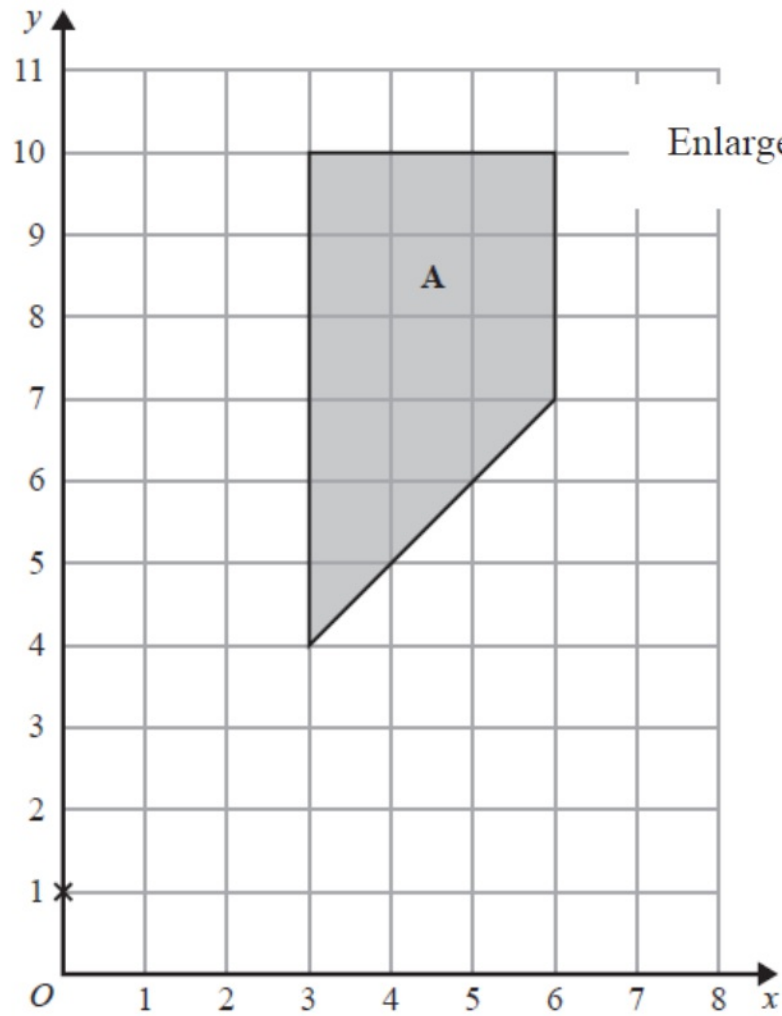


Shape **T** is reflected in the line $x = -1$ to give shape **R**.
Shape **R** is reflected in the line $y = -2$ to give shape **S**.
Describe the **single** transformation that will map shape **T** to shape **S**.

Rotation
 180°
Centre $(-1, -2)$

(Total for Question 7 is 2 marks)

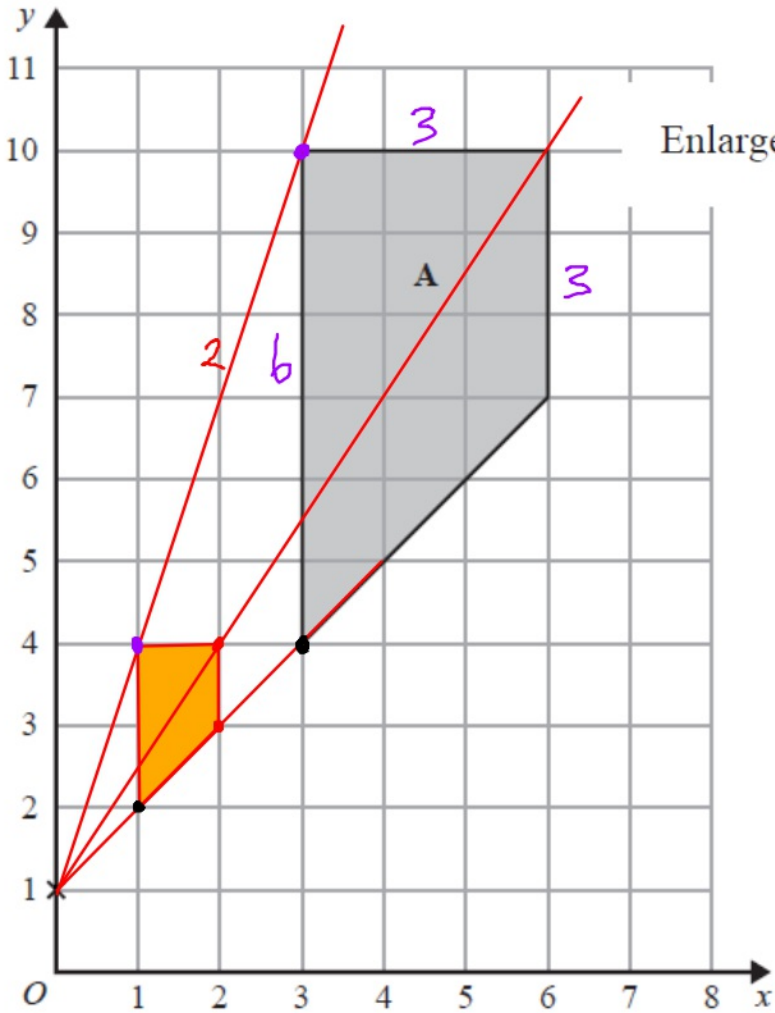
7
G41



Enlarge shape **A** by scale factor $\frac{1}{3}$ centre (0, 1)

(Total for Question 7 is 2 marks)

7
G41



Enlarge shape A by scale factor $\frac{1}{3}$ centre (0, 1)

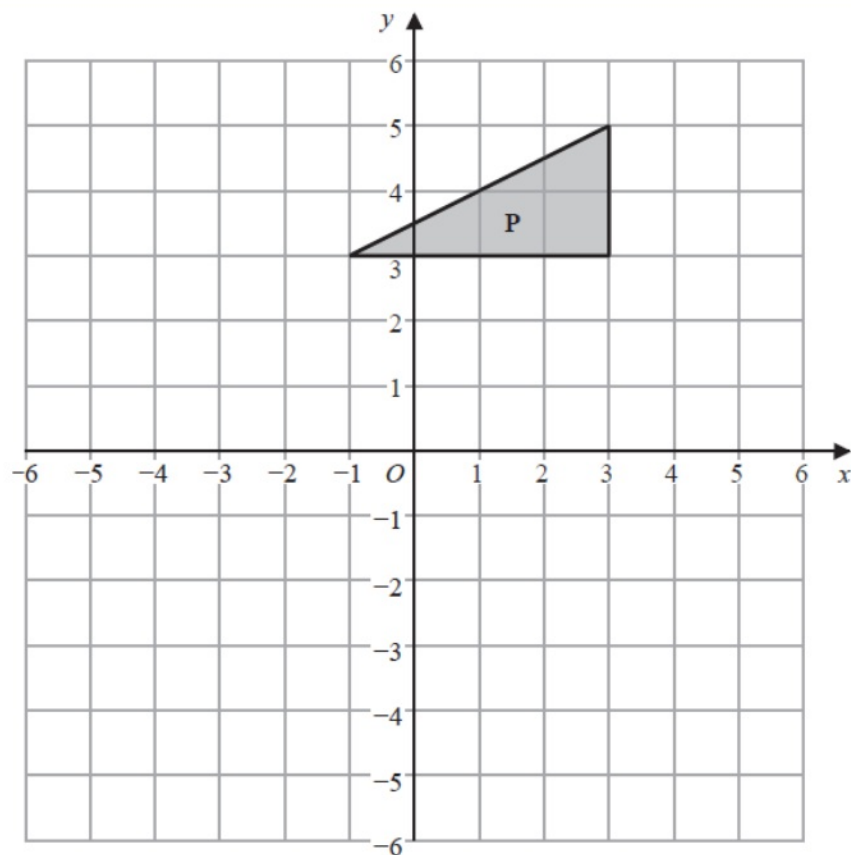
Right Up
 • 3 1 3 1
 • 3 1 9 3

(Total for Question 7 is 2 marks)

8

G39

G40

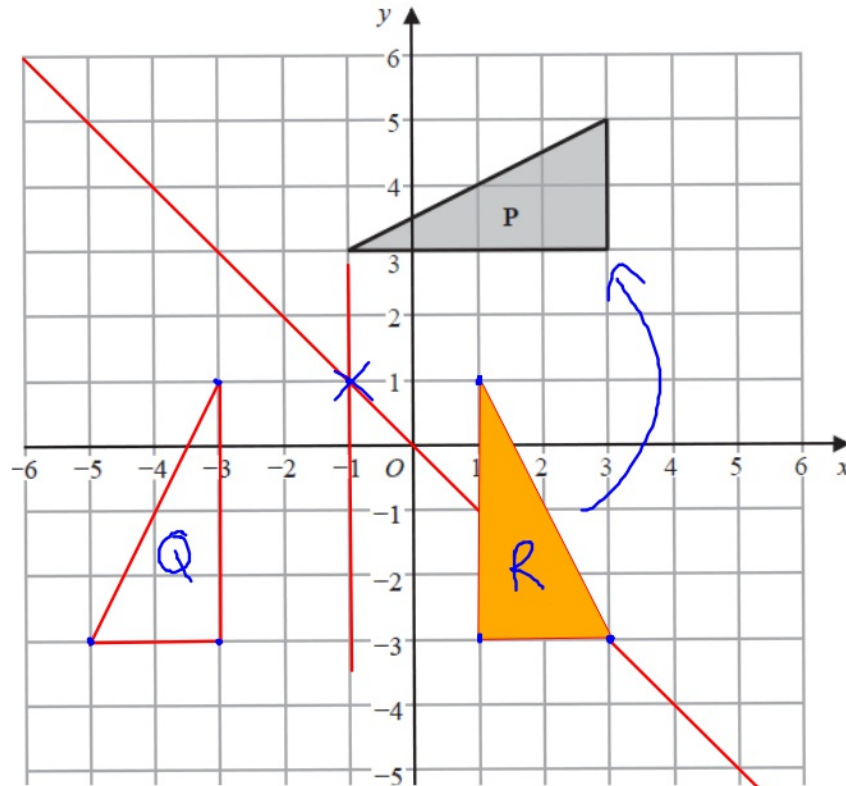


Triangle **P** is reflected in the line $y = -x$ to give triangle **Q**.
Triangle **Q** is reflected in the line $x = -1$ to give triangle **R**.

Describe fully the single transformation that maps triangle **R** to triangle **P**.

(Total for Question 8 is 3 marks)

8



Rotation
 90° acw
from $(-1, 1)$ ✓

Triangle **P** is reflected in the line $y = -x$ to give triangle **Q**.
Triangle **Q** is reflected in the line $x = -1$ to give triangle **R**.

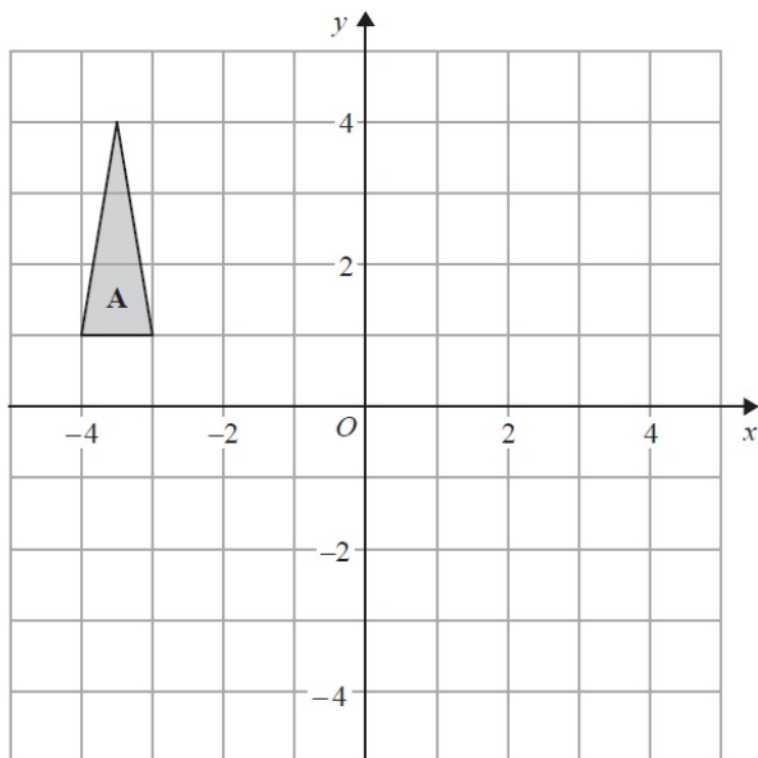
Describe fully the single transformation that maps triangle **R** to triangle **P**.

(Total for Question 8 is 3 marks)

20

Video Created by W Neill

G42



Triangle **A** is transformed by the combined transformation of a rotation of 180° about the point $(-2, 0)$ followed by a translation with vector $\begin{pmatrix} -3 \\ 2 \end{pmatrix}$

One point on triangle **A** is invariant under the combined transformation.

Find the coordinates of this point.

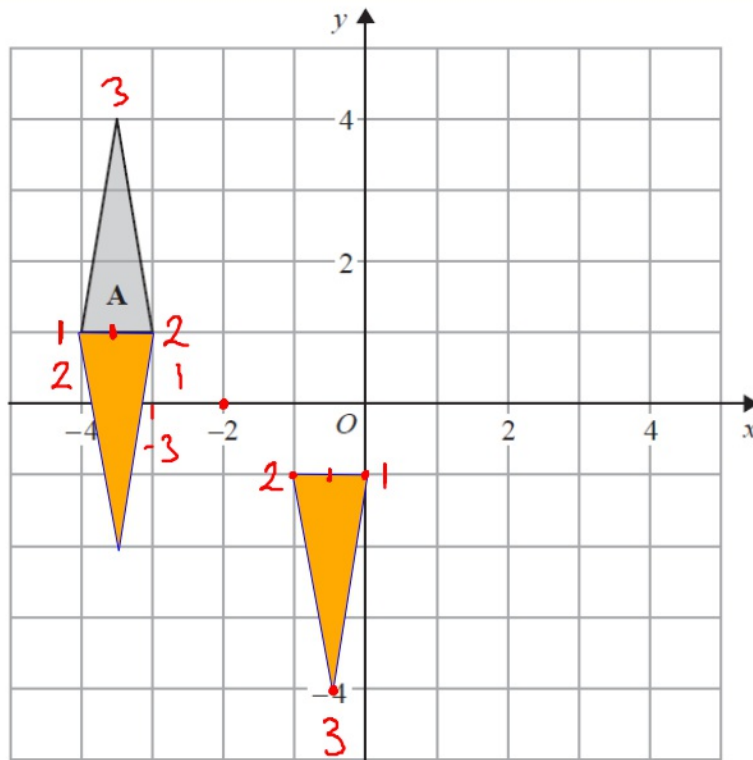
(.....,))

(Total for Question 20 is 2 marks)

20

Video Created by W Neill

G42



Triangle A is transformed by the combined transformation of a rotation of 180° about the point $(-2, 0)$ followed by a translation with vector $\begin{pmatrix} -3 \\ 2 \end{pmatrix}$

One point on triangle A is invariant under the combined transformation.

Find the coordinates of this point.

→ does not move

(-3.5, 1) ✓

(Total for Question 20 is 2 marks)

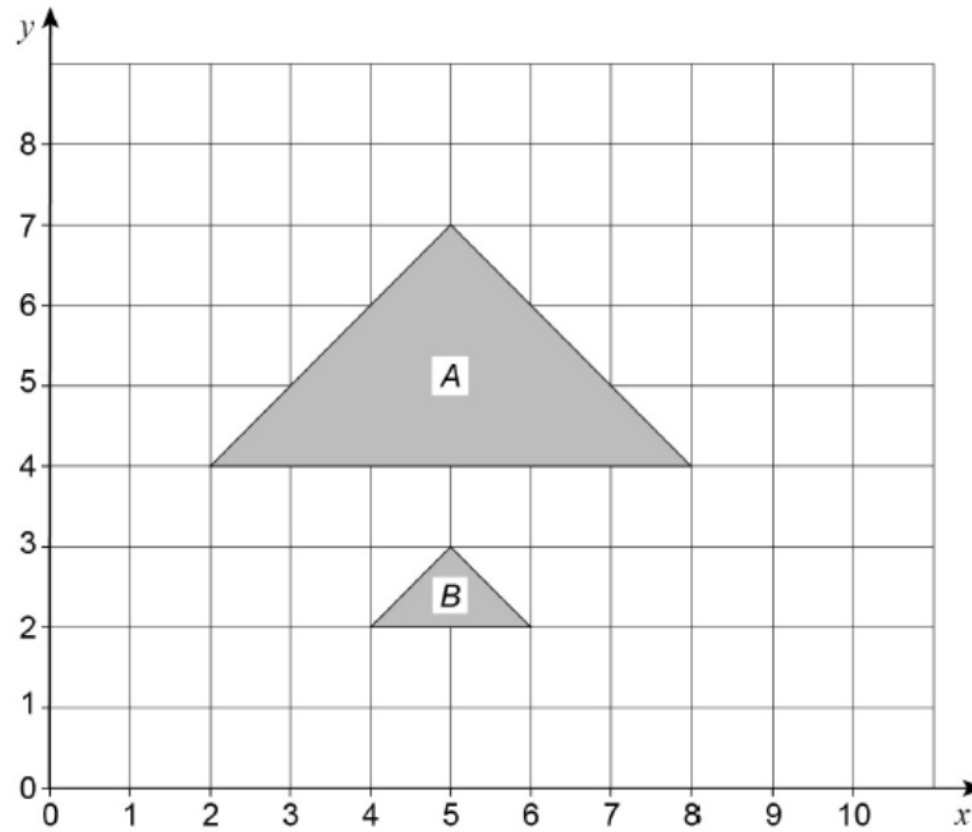
AQA

24

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

Video created by W Neill

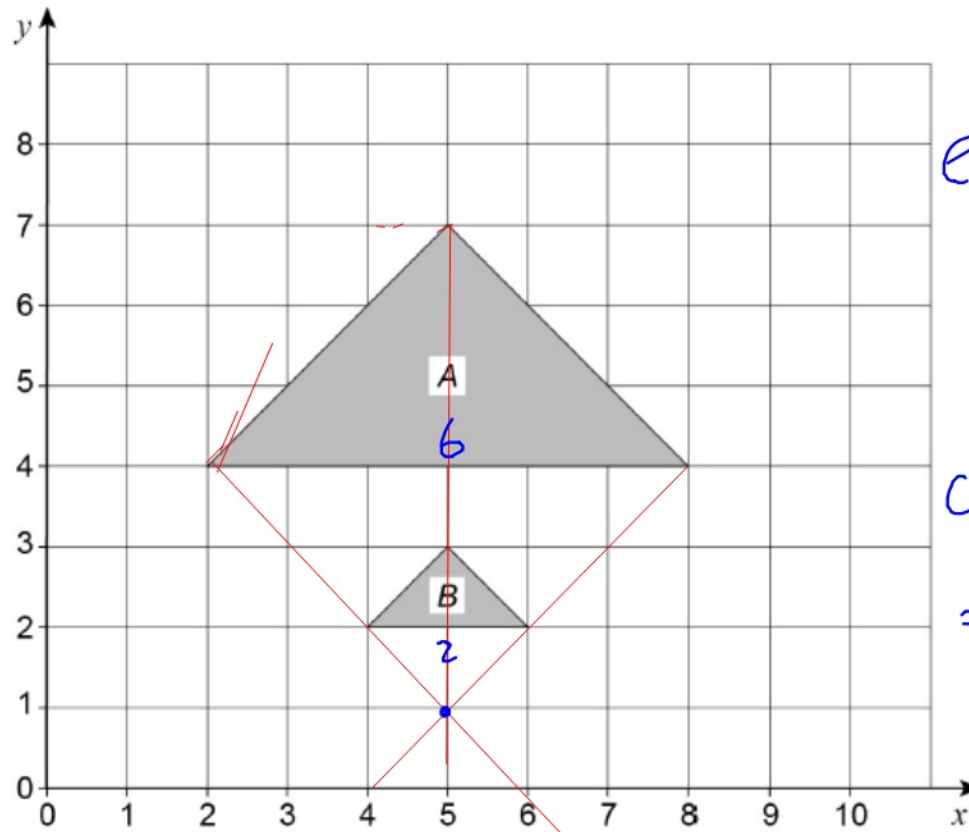
G41



[3 marks]

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

G41



enlargement ✓
Sf $\frac{1}{3}$ ✓
centre of Enl
= (5, 1) ✓

[3 marks]

7 ABC is a right-angled triangle.

A is the point $(-3, -2)$

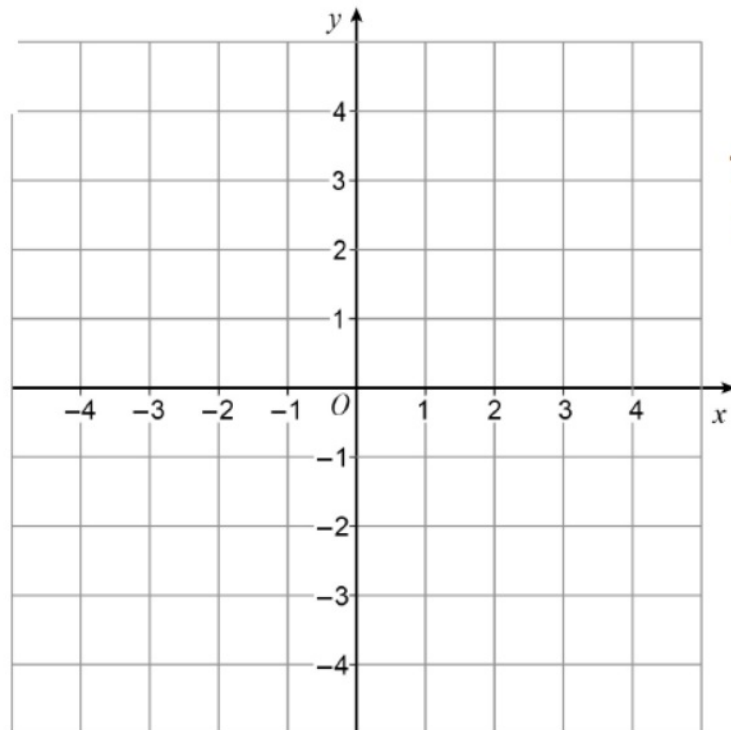
B is the point $(1, -2)$

C is a point on the line $y = 4$

Video created by W Neill

7 (a) Draw triangle ABC on the centimetre grid below. [3 marks]

A22
G39



7 (b) Work out the area of triangle ABC . [2 marks]

Answer _____ cm^2

7 ABC is a right-angled triangle.

A is the point $(-3, -2)$

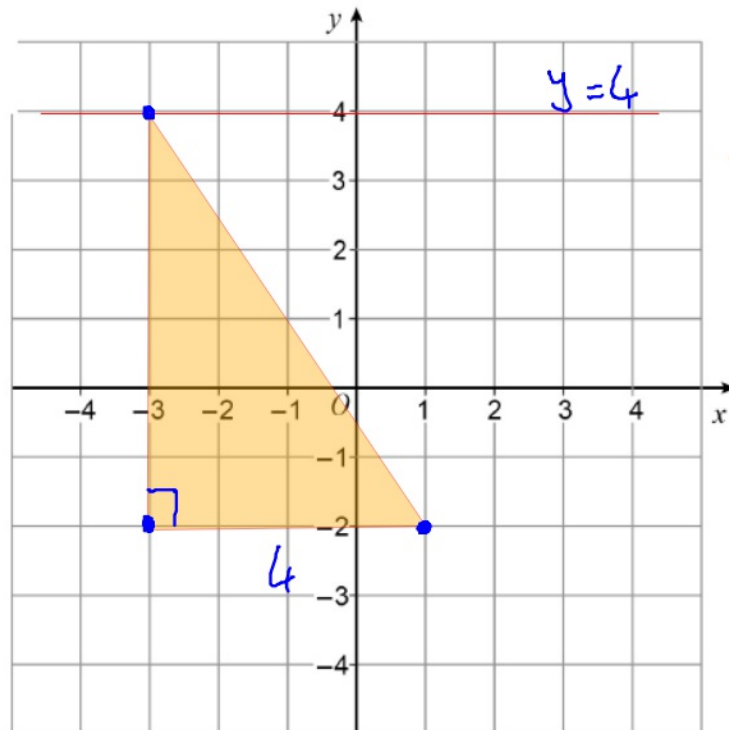
B is the point $(1, -2)$

C is a point on the line $y = 4$

Video created by W Neill

7 (a) Draw triangle ABC on the centimetre grid below. [3 marks]

A22
G39



7 (b) Work out the area of triangle ABC. [2 marks]
G18

$$\frac{B \times H}{2} = \frac{4 \times 6}{2} = \frac{24}{2}$$

Answer 12 ✓ cm²

16 Circle the point that lies on the line $x - 3 = 0$

[1 mark]

G39

(3, 0)

(0, 3)

(-3, 0)

(0, -3)

16

Circle the point that lies on the line

$$x - 3 = 0$$
$$x = 3$$

[1 mark]

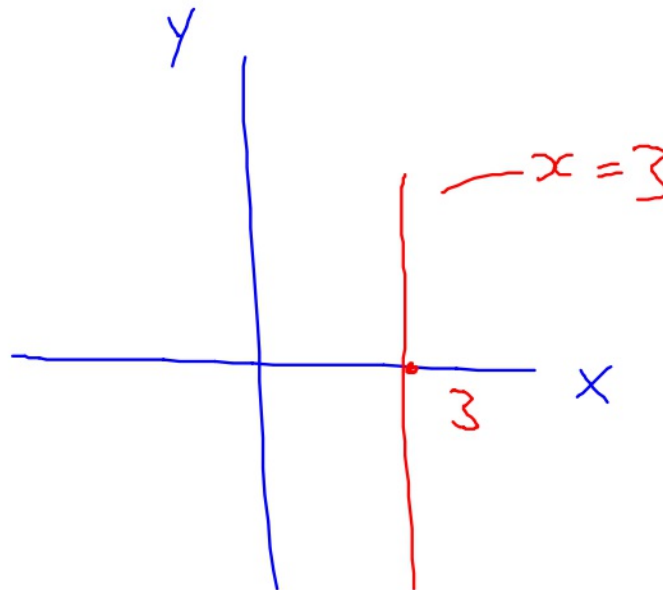
639

(3, 0)

(0, 3)

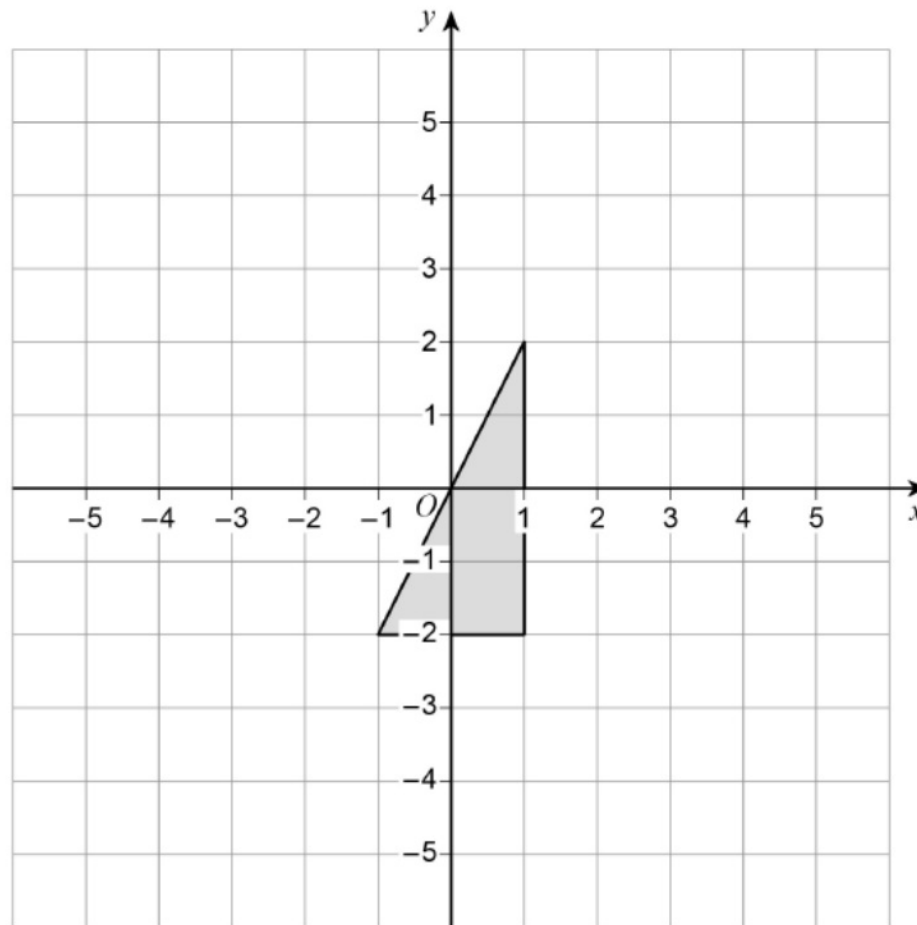
(-3, 0)

(0, -3)



21 (a) Reflect the triangle in the line $x = 2$

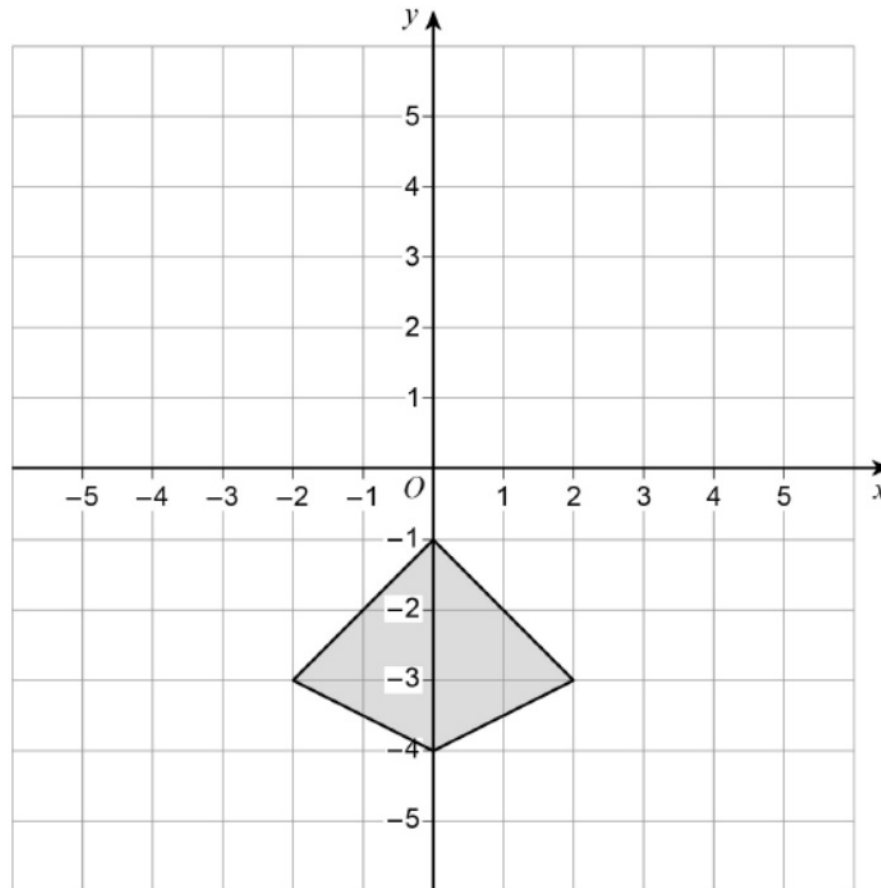
639



21 (b) Rotate the kite 90° anticlockwise about $(0, 0)$

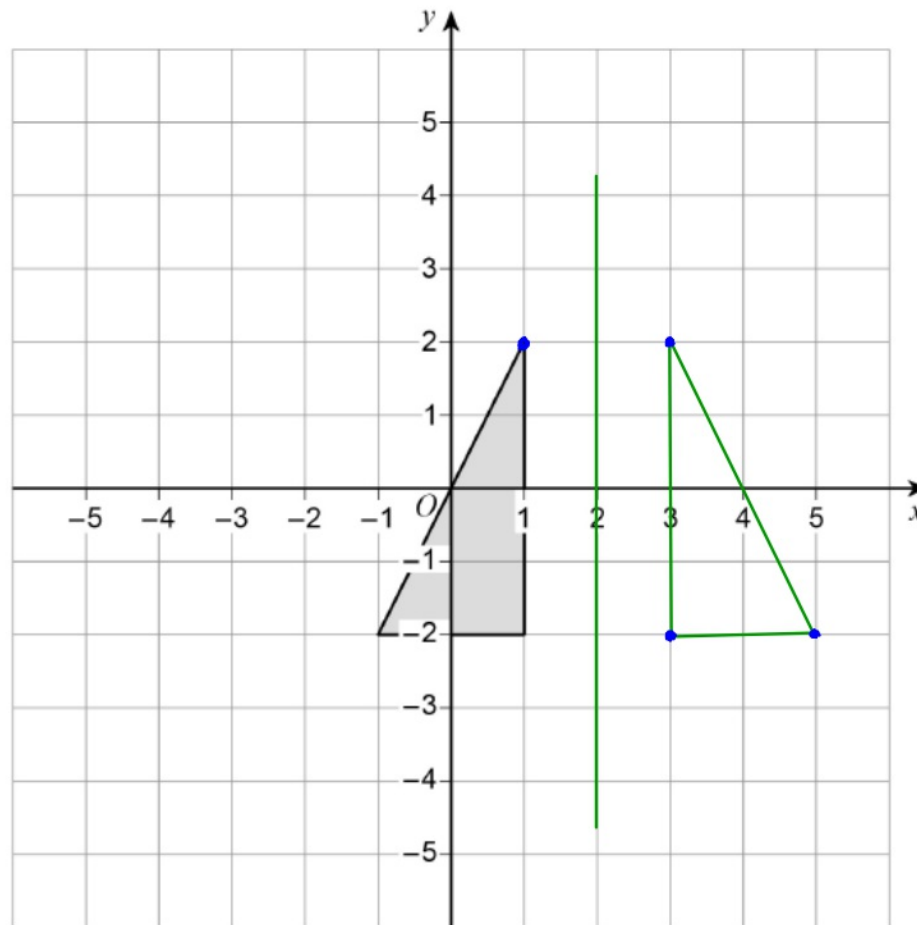
[2 marks]

G40



21 (a) Reflect the triangle in the line $x = 2$

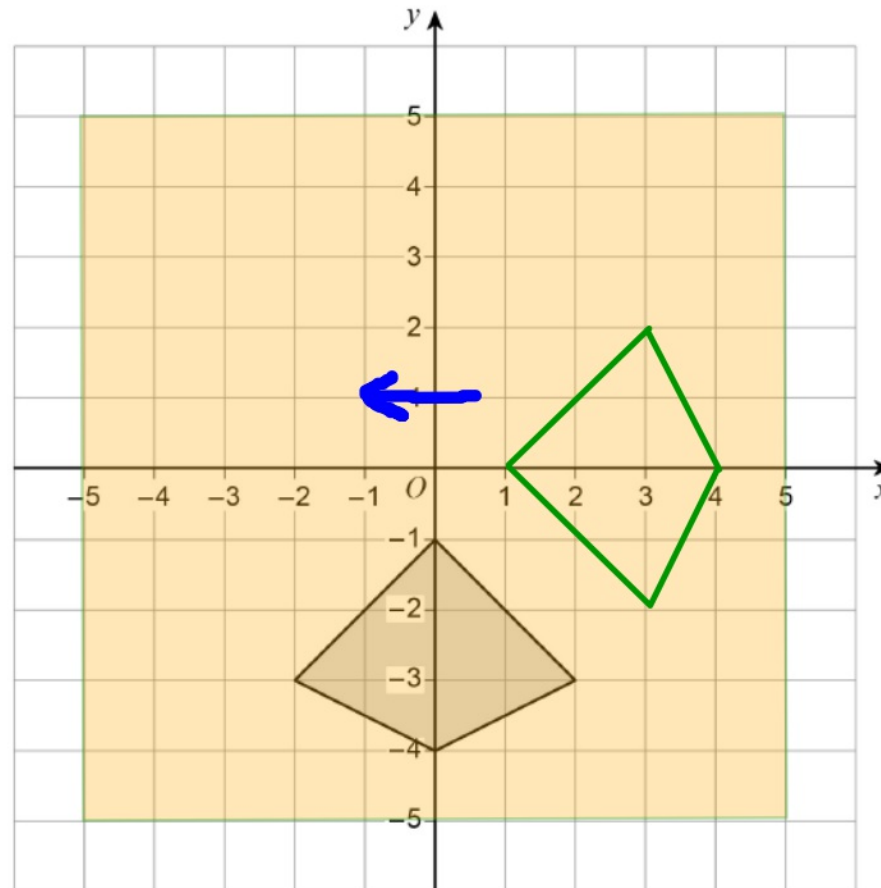
639



21 (b) Rotate the kite 90° anticlockwise about (0, 0)

[2 marks]

G40

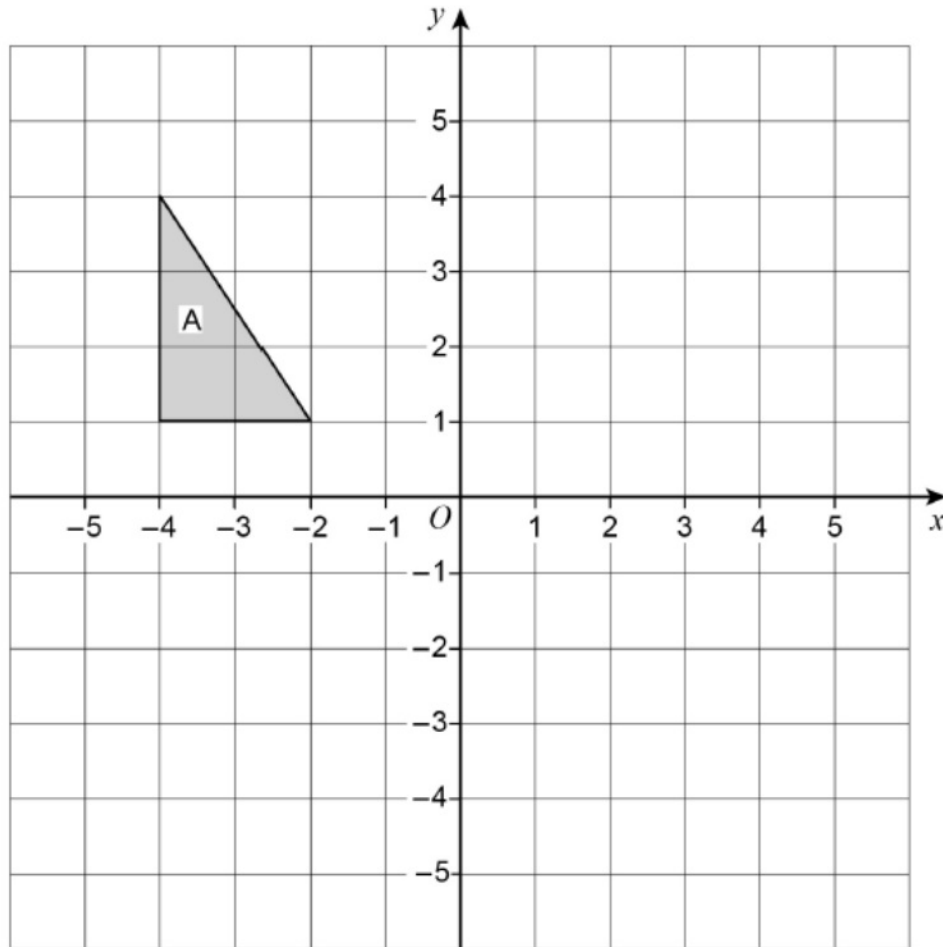


12

Reflect shape A in the x -axis.

Video created by W Neill

639

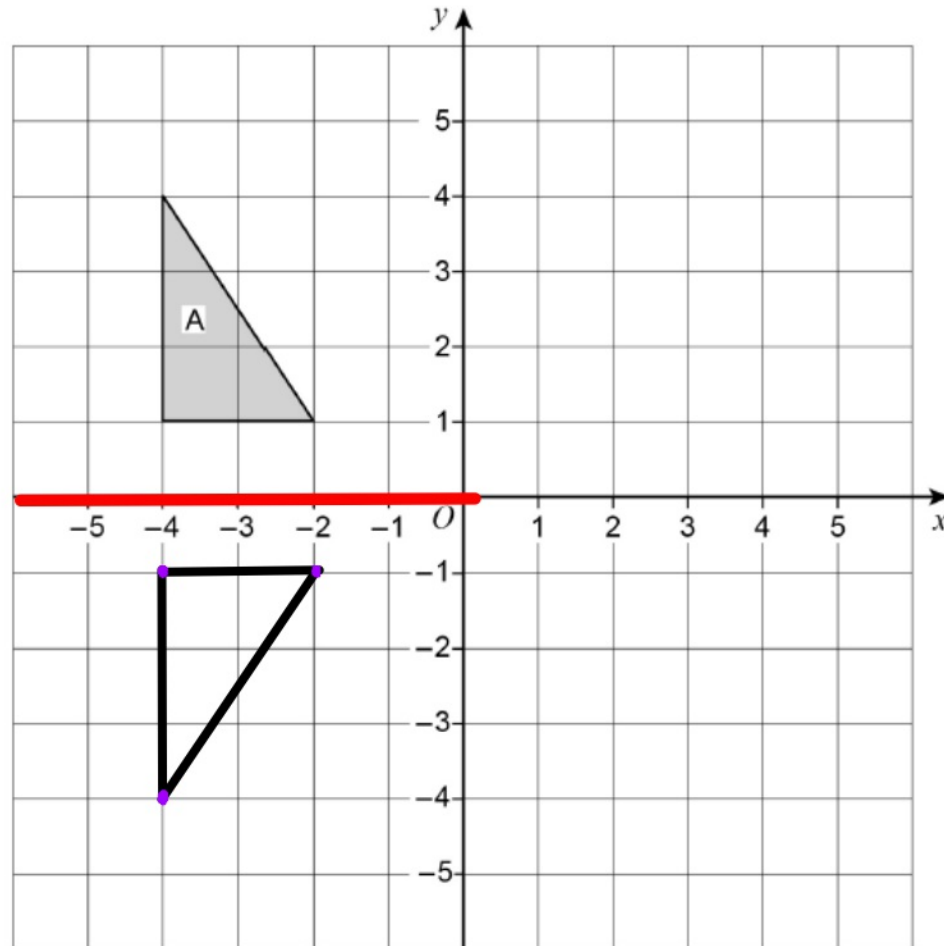


12

Reflect shape A in the x -axis.

Video created by W Neill

639

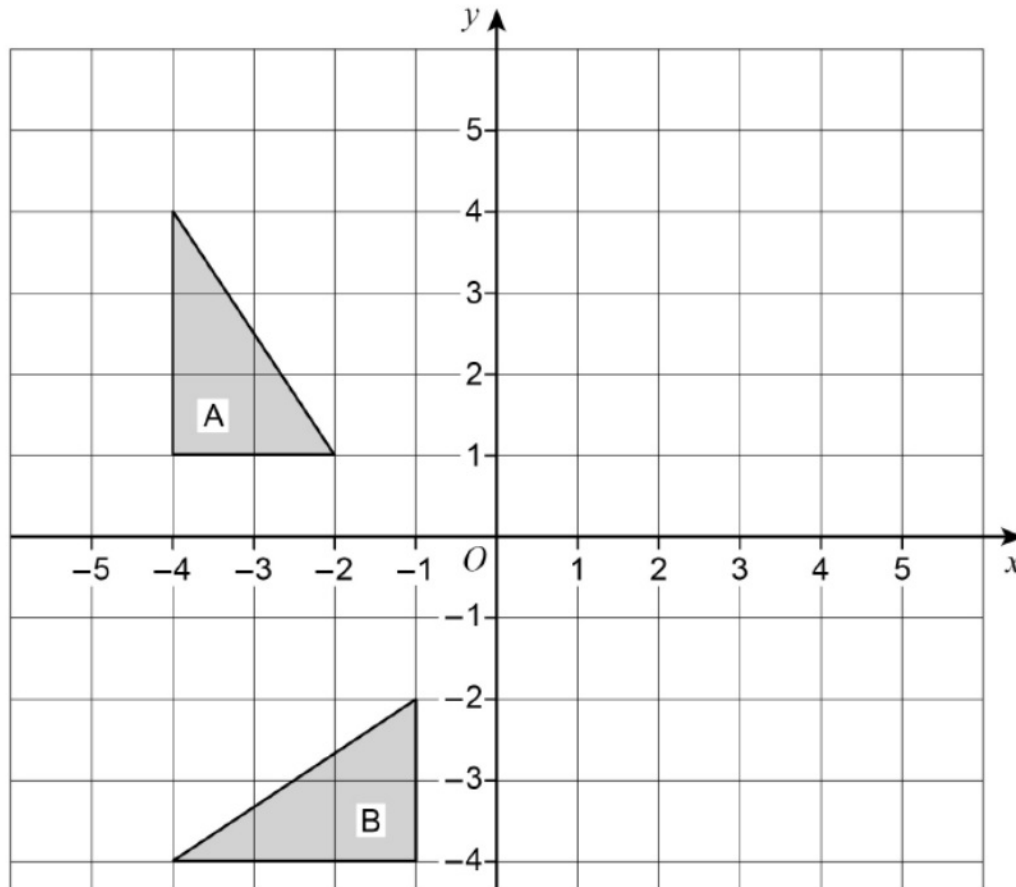


15

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

[3 marks]

G40

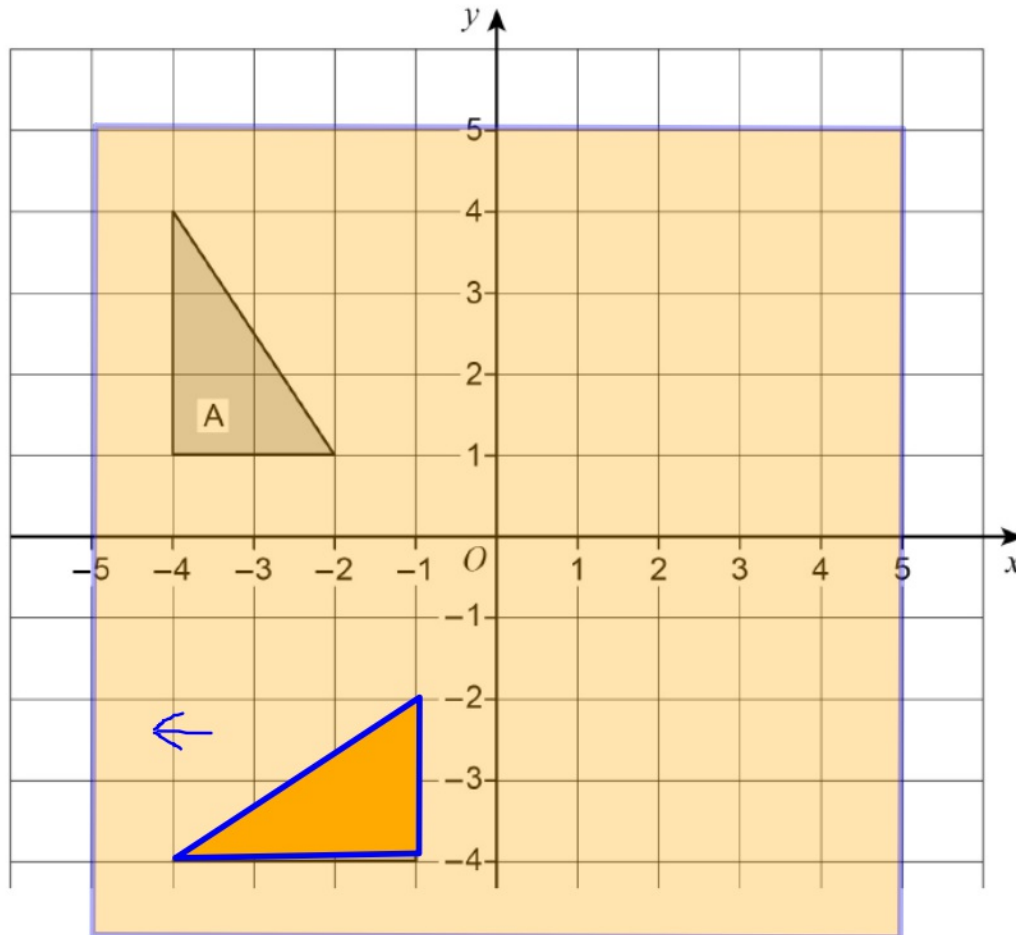


15

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

[3 marks]

G40



Rotation
 90° ✓
ac/w
from (0,0)

20 A shape is translated by the vector $\begin{pmatrix} 0 \\ 4 \end{pmatrix}$

G38 In which direction does the shape move?
Circle your answer.

[1 mark]

up

down

left

right

20

A shape is translated by the vector

$$+ \begin{pmatrix} 0 \\ 4 \end{pmatrix}$$

Right/left
+ up / - down

G38

In which direction does the shape move?

Circle your answer.

[1 mark]

up

down

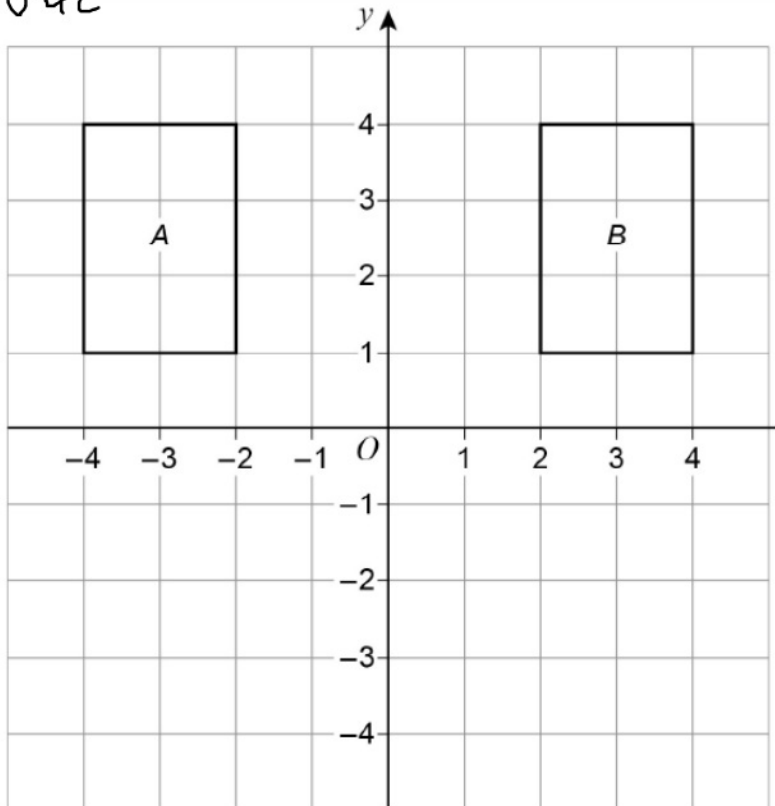
left

right

21 (a) The diagram shows rectangles A and B.

Video created by W Neill

G42



Rectangle A can be mapped to rectangle B by a **single** transformation.

Javed says,

“The **only** single transformation is a reflection in the y -axis because the rectangles are on opposite sides of the y -axis.”

Is he correct?

Tick a box.

Yes

No

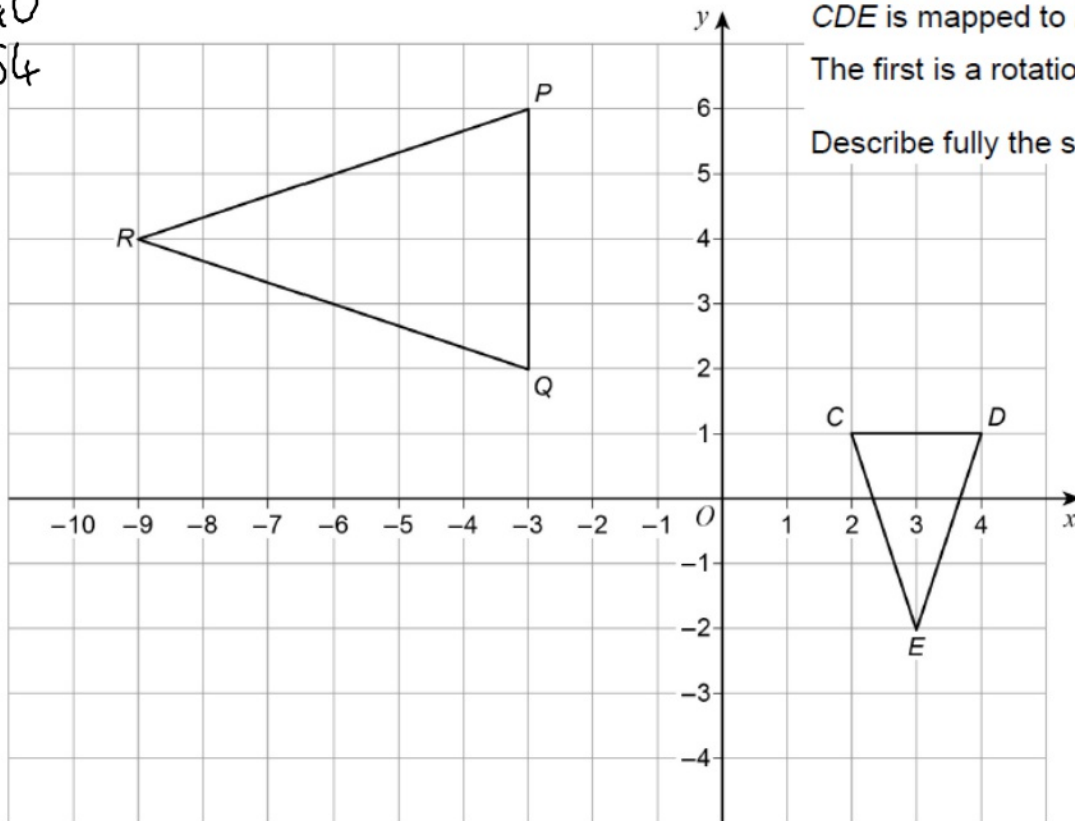
Give a reason for your answer.

[1 mark]

21 (b) This diagram shows triangles CDE and PQR .

Video created by W Neill

G40
G54



CDE is mapped to PQR by combining two single transformations.

The first is a rotation of 90° anticlockwise about E .

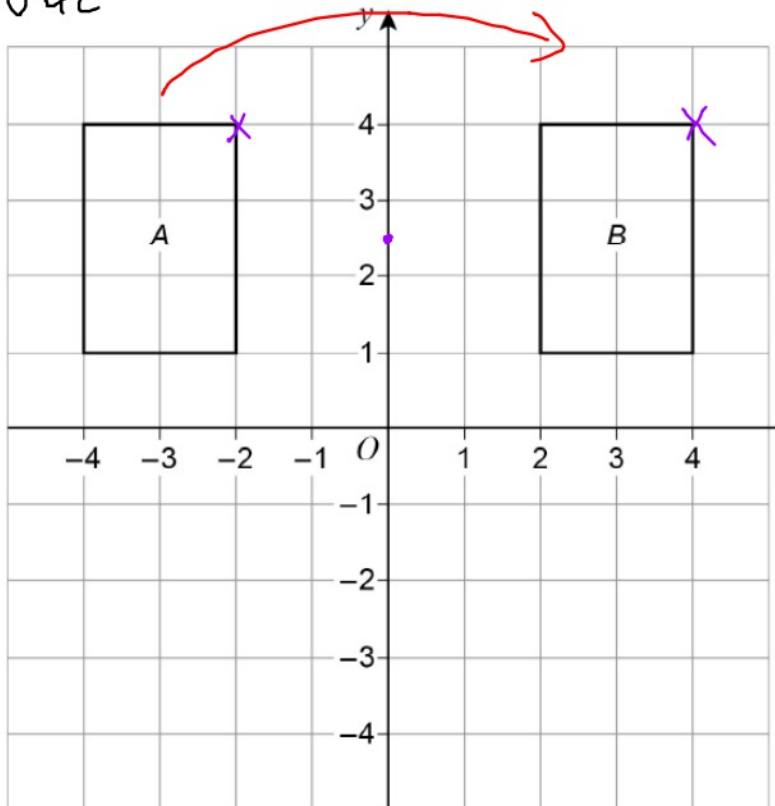
Describe fully the second transformation.

[3 marks]

21 (a) The diagram shows rectangles A and B.

Video created by W Neill

G42



Rectangle A can be mapped to rectangle B by a **single** transformation.

Javed says,

“The **only** single transformation is a reflection in the y -axis because the rectangles are on opposite sides of the y -axis.”

Is he correct?

Tick a box.

Yes

No

Give a reason for your answer.

other transformations

eg Translation

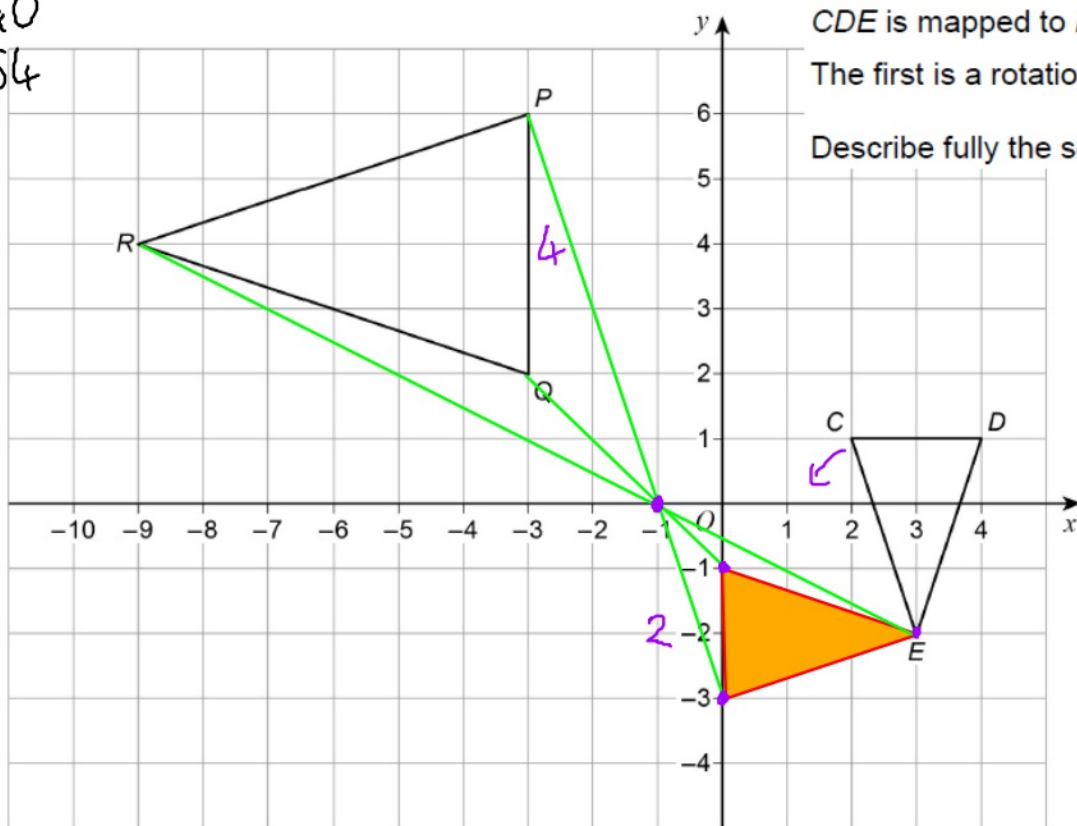
$$\begin{pmatrix} 6 \\ 0 \end{pmatrix}$$

[1 mark]

21 (b) This diagram shows triangles CDE and PQR .

Video created by W Neill

G40
G54



CDE is mapped to PQR by combining two single transformations.

The first is a rotation of 90° anticlockwise about E .

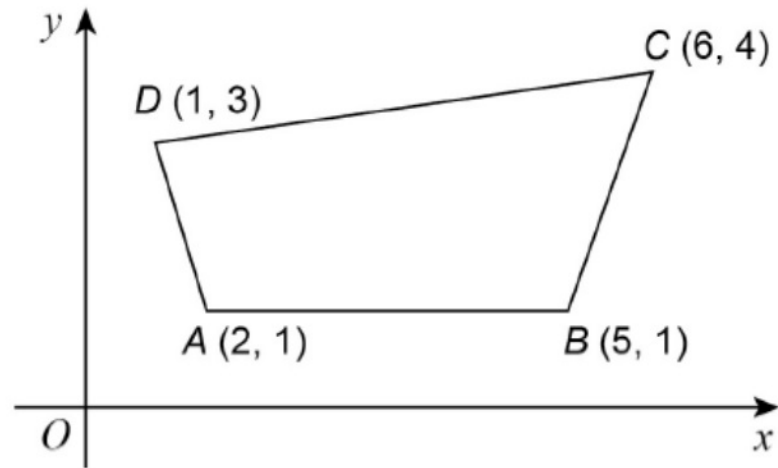
Describe fully the second transformation.

Enlargement
by Sf -2
centre (-1,0) ✓

[3 marks]

26 (a) A sketch of a quadrilateral $ABCD$ is shown.

G41



Not drawn accurately

$ABCD$ is enlarged, centre B , scale factor $\frac{1}{3}$

Circle the vertex that is invariant.

[1 mark]

A

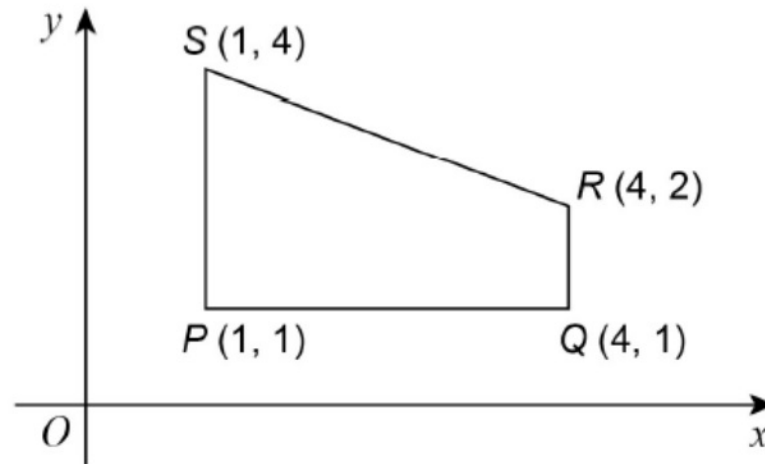
B

C

D

26 (b) A sketch of a quadrilateral $PQRS$ is shown.

G39



Not drawn accurately

$PQRS$ is reflected in the line $y = x$

Circle the vertex that is invariant.

[1 mark]

P

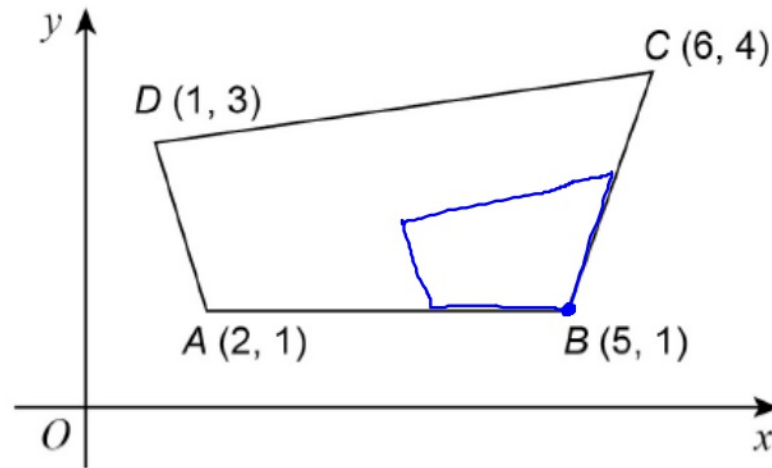
Q

R

S

26 (a) A sketch of a quadrilateral $ABCD$ is shown.

G41



Not drawn accurately

$ABCD$ is enlarged, centre B , scale factor $\frac{1}{3}$

Circle the vertex that is invariant.

→ doesn't change

A

B

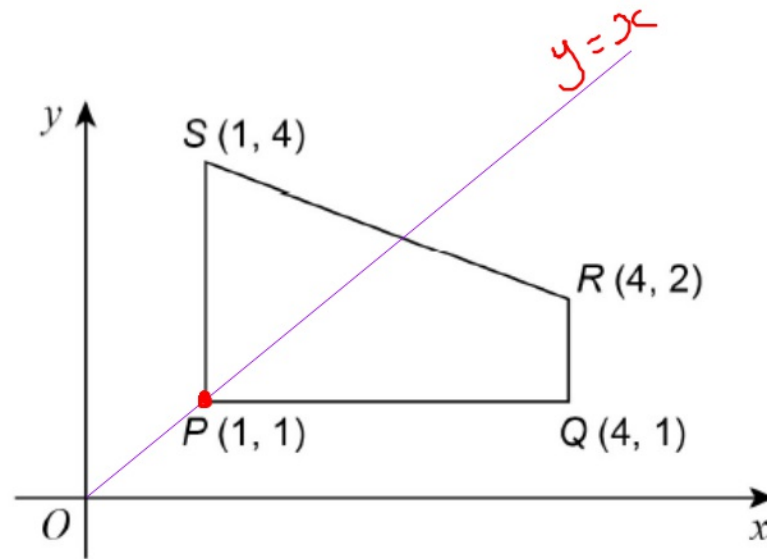
C

D

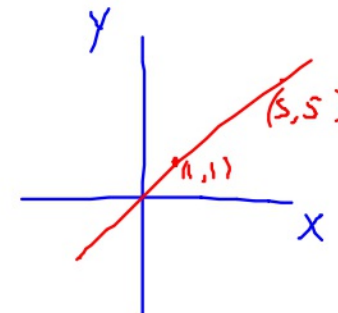
[1 mark]

26 (b) A sketch of a quadrilateral $PQRS$ is shown.

G39



Not drawn accurately



$PQRS$ is reflected in the line $y = x$

Circle the vertex that is invariant.

P

Q

R

S

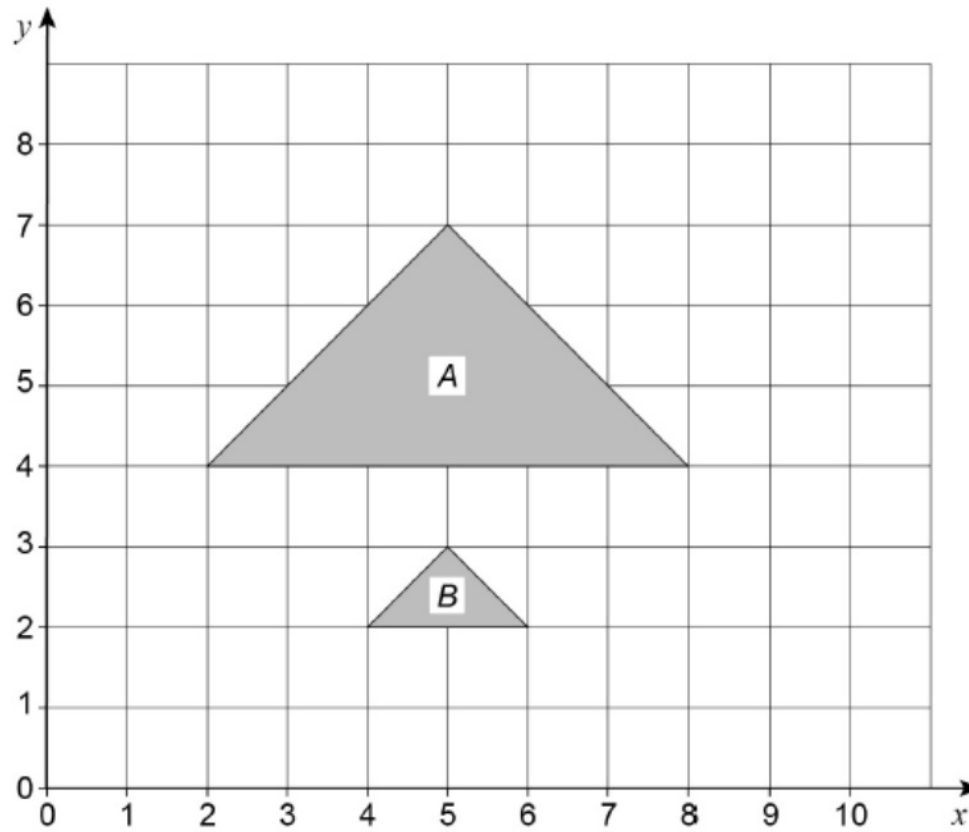
[1 mark]

7

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

Video created by W Neill

G41



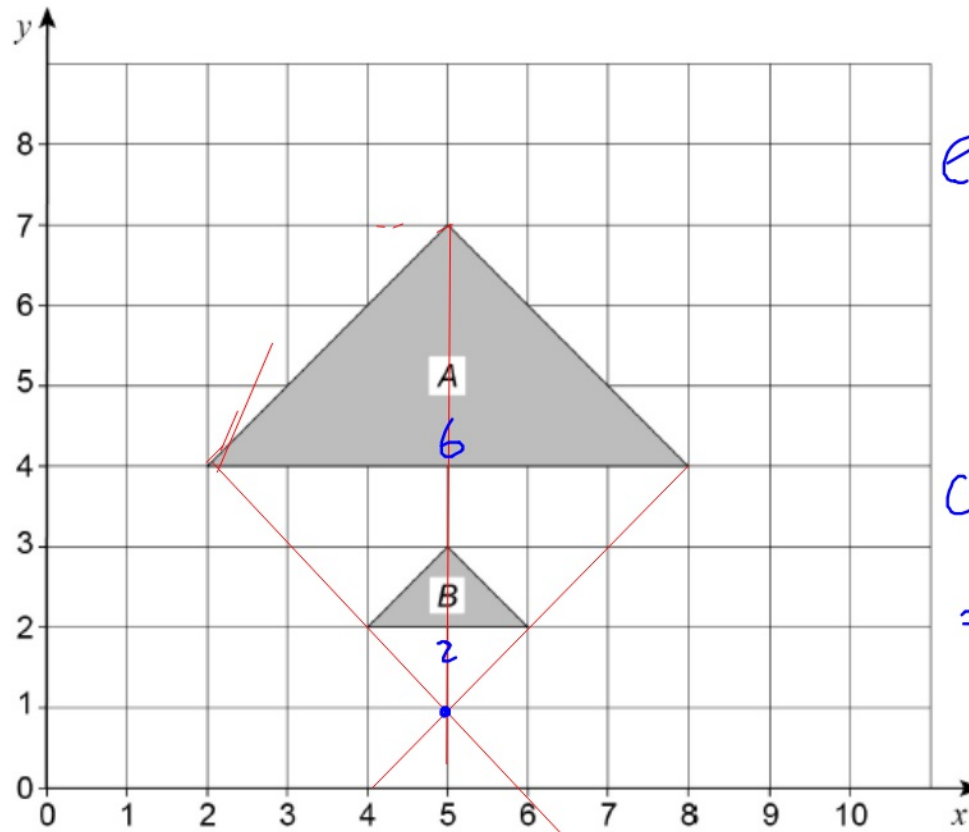
[3 marks]

7

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

Video created by W Neill

G41



enlargement ✓
Sf $\frac{1}{3}$ ✓
centre of Enl
= (5, 1) ✓

[3 marks]

4 Circle the equation of the line that is parallel to the x -axis.

[1 mark]

G39

$$y = -5$$

$$x - y = 0$$

$$x = 3$$

$$x + y = 0$$

4 Circle the equation of the line that is parallel to the x -axis.

[1 mark]

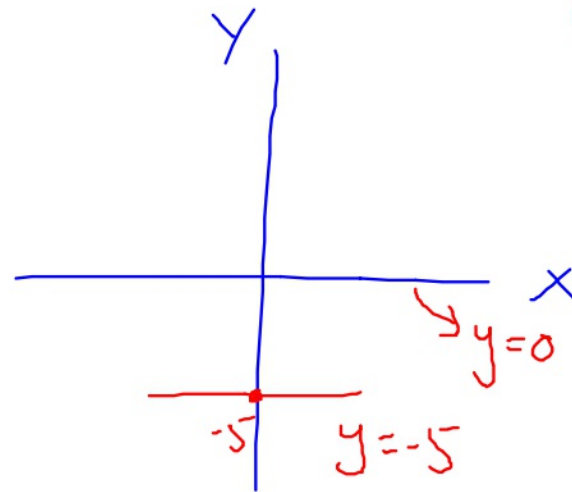
G39

$y = -5$

$x - y = 0$

$x = 3$

$x + y = 0$



2 The vector $\begin{pmatrix} -2 \\ 3 \end{pmatrix}$ translates A to B.

G38 Circle the vector that translates B to A.

[1 mark]

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

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

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

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

2 The vector $\begin{pmatrix} -2 \\ 3 \end{pmatrix}$ translates A to B. left 2
up 3

G38 Circle the vector that translates B to A.

[1 mark]

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

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

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

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

Right 2
down 3

1 A shape is translated by the vector $\begin{pmatrix} 0 \\ 4 \end{pmatrix}$

G38 In which direction does the shape move?
Circle your answer.

[1 mark]

up

down

left

right

1

A shape is translated by the vector

$$+ \begin{pmatrix} 0 \\ 4 \end{pmatrix}$$

Right/left
+ up / - down

G38

In which direction does the shape move?

Circle your answer.

[1 mark]

up

down

left

right

