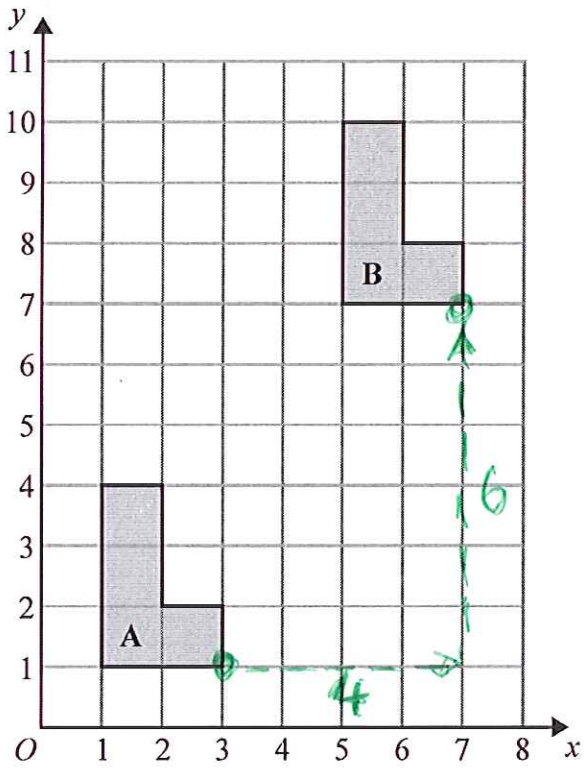
TRANSFORMATIONS (SINGLE)

DATE OF SOLUTIONS: 15/05/2018
MAXIMUM MARK: 83

SOLUTIONS

GCSE (+ IGCSE) EXAM QUESTION PRACTICE

1. [Edexcel, 2015] Transformations (Translations) **[2 Marks]**

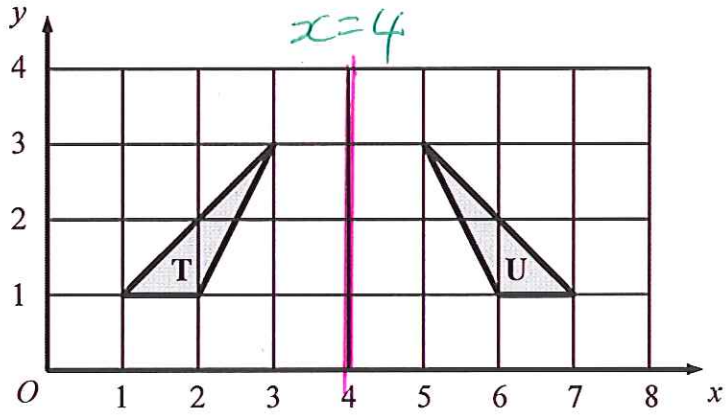


Describe fully the single transformation that maps shape **A** onto shape **B**.

TRANSLATION, BY VECTOR $\begin{pmatrix} 4 \\ 6 \end{pmatrix}$ A1

A1

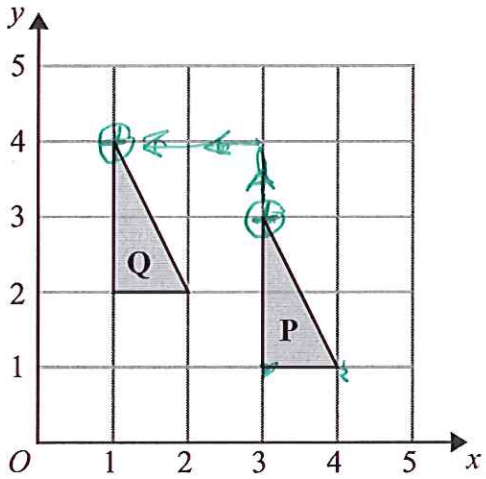
2. [Edexcel, 2007] Transformations (Reflections) **[2 Marks]**



Describe fully the single transformation which maps triangle **T** onto triangle **U**.

REFLECTION, IN LINE $x = 4$

B1 B1

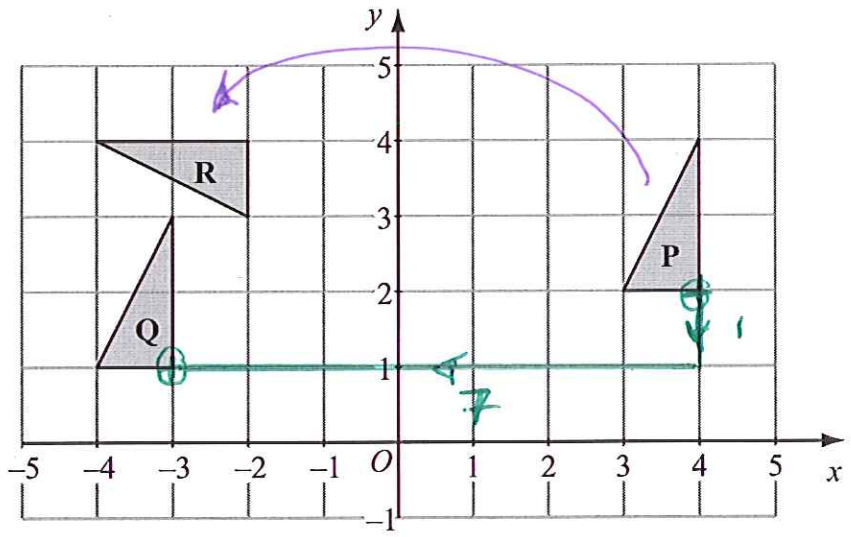


Describe fully the single transformation which maps triangle **P** onto triangle **Q**.

TRANSCATION B1

BY VECTOR $\begin{pmatrix} -2 \\ 1 \end{pmatrix}$ B1

4. [Edexcel, 2008] Transformations (Mixed) **[5 Marks]**



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

TRANSLATION, BY VECTOR $\begin{pmatrix} -7 \\ -1 \end{pmatrix}$ B1

B1

(2)

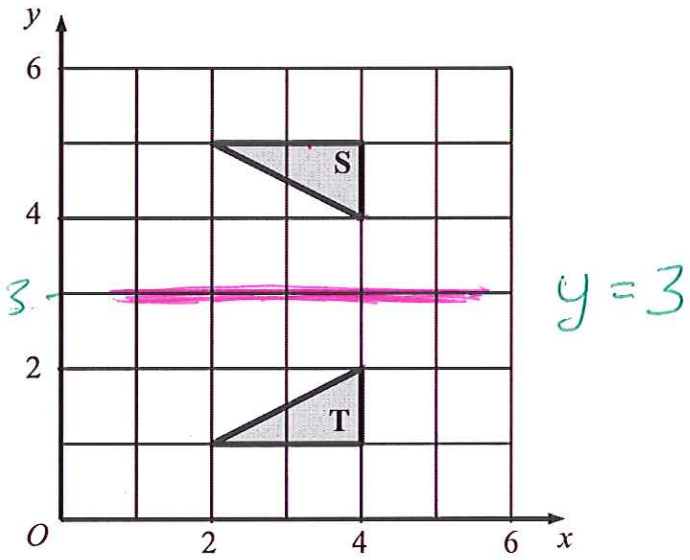
(b) Describe fully the single transformation which maps triangle **P** onto triangle **R**.

ROTATION B1, 90° ANTI-CLOCKWISE, B1

CENTRE = (0, 0) B1

(3)

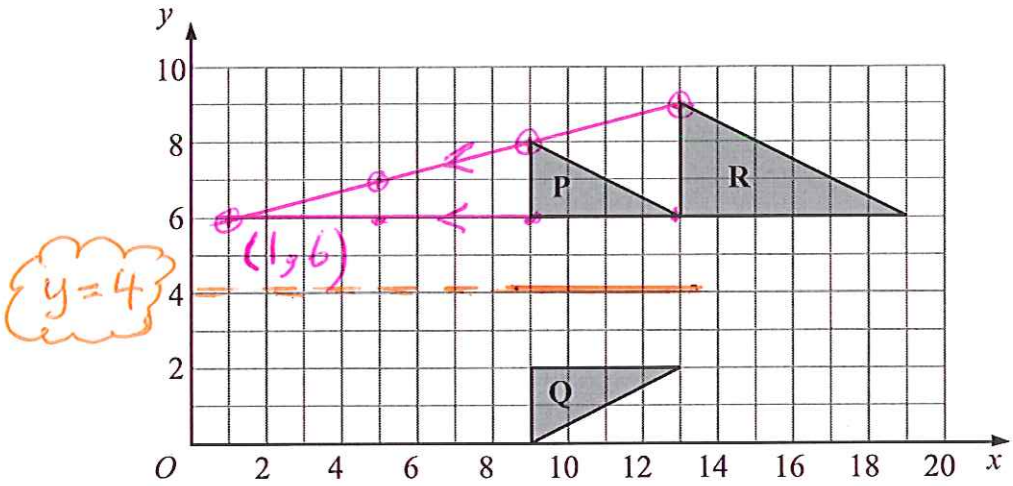
5. [Edexcel, 2006] Transformations (Reflections) **[2 Marks]**



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

REFLECTION, (B1) IN LINE $y = 3$ (B1)

6. [Edexcel, 2009] Transformations (Mixed) **[5 Marks]**



(a) Describe fully the single transformation which maps triangle **P** onto triangle **Q**. B1

REFLECTION, MIRROR LINE IS $y = 4$ B1

(2)

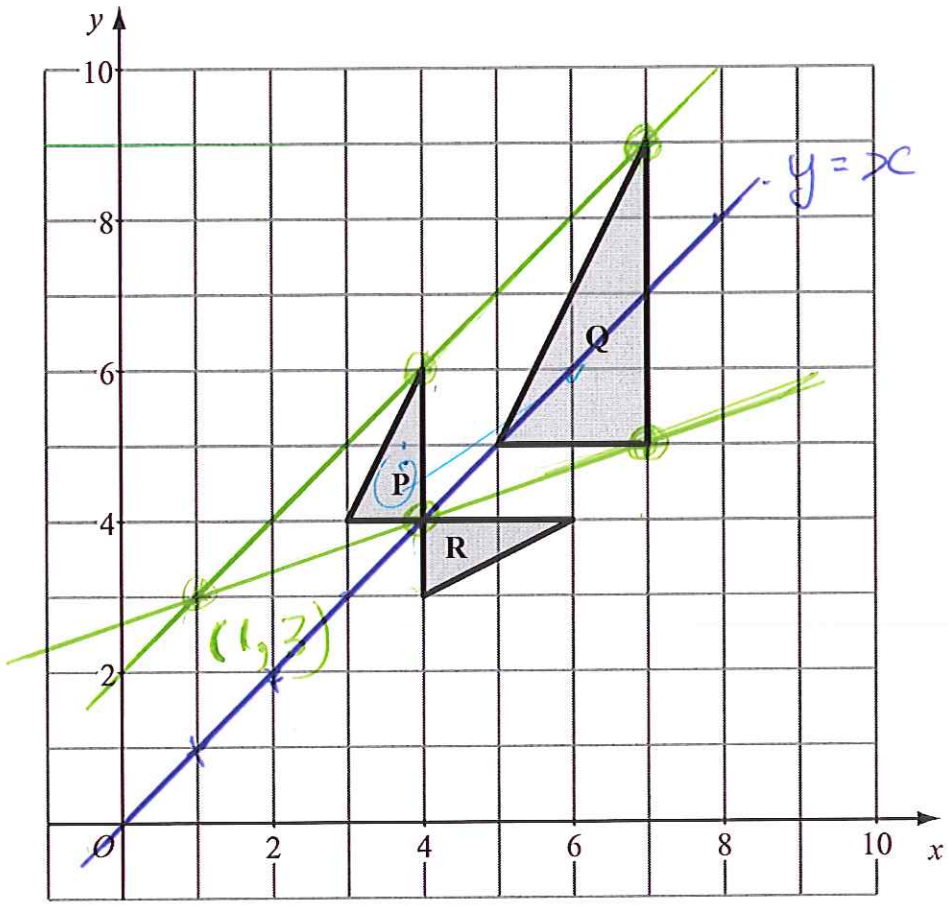
(b) Describe fully the single transformation which maps triangle **P** onto triangle **R**. B1

B1 ENLARGEMENT, SCALE FACTOR = 1.5

CENTRE = (1, 6) B1

(3)

7. [Edexcel, 2008] Transformations (Mixed) **[5 Marks]**



(a) Describe fully the single transformation that maps triangle **P** onto triangle **Q**.

B1 B1

ENLARGEMENT, SCALE FACTOR = 2

CENTRE (1, 3) B1

(3)

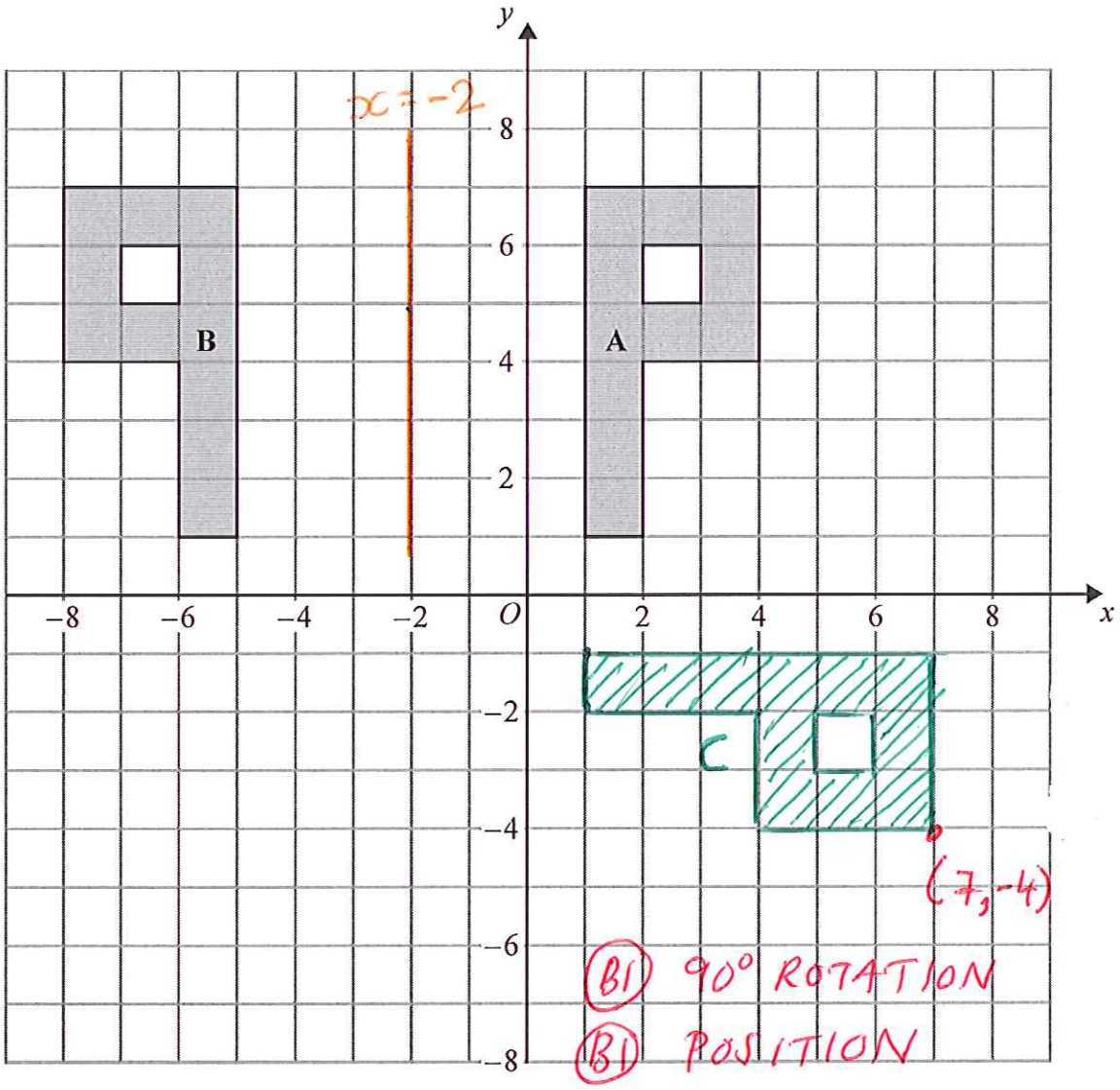
(b) Describe fully the single transformation that maps triangle **P** onto triangle **R**.

B1 B1

REFLECTION, IN LINE $y = x$

(2)

8. [Edexcel, 2014] Transformations (Mixed) **[4 Marks]**



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

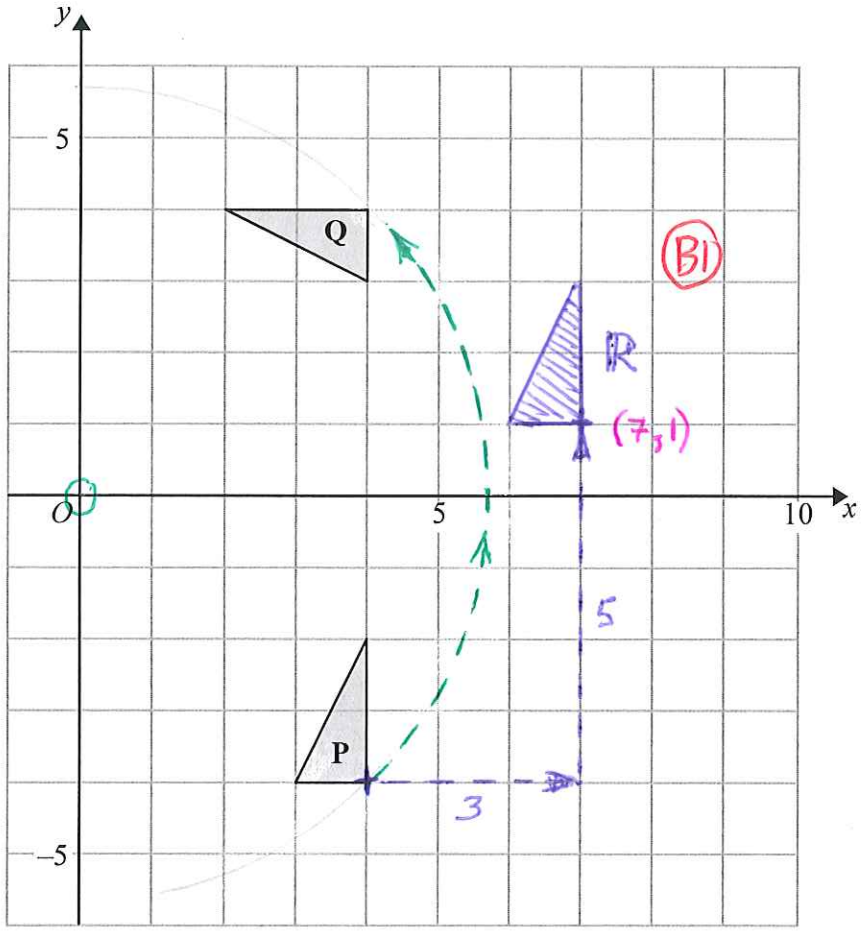
REFLECTION, MIRROR LINE IS $x = -2$ B1 B1

(2)

(b) On the grid, rotate shape **A** 90° clockwise about the origin O.
Label the new shape **C**.

(2)

9. [Edexcel, 2014] Transformations (Mixed) **[4 Marks]**



(a) Describe fully the single transformation that maps triangle **P** onto triangle **Q**.

ROTATION; (B1) 90° ANTI-CLOCKWISE (B1)

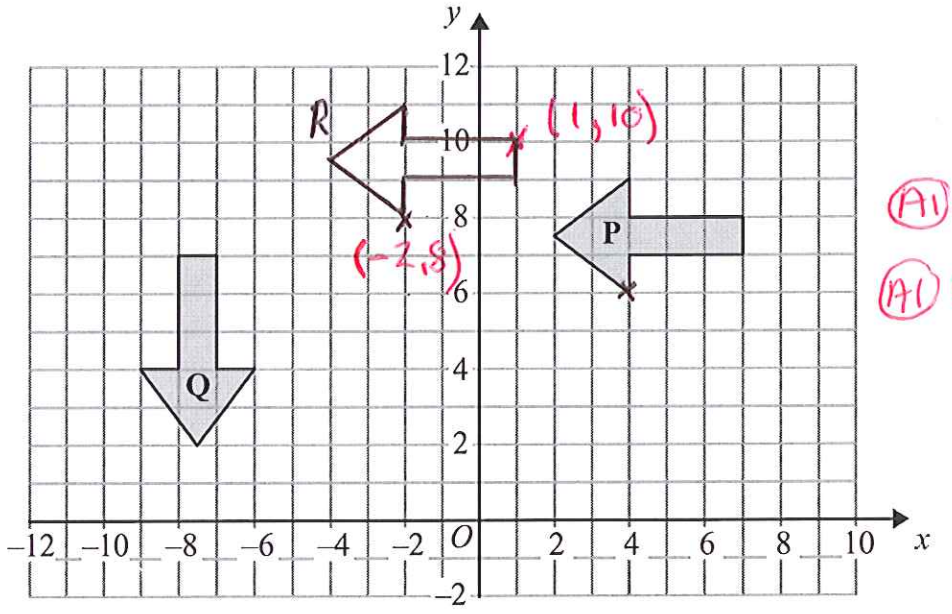
CENTRE AT (0,0) (B1)

(3)

(b) On the grid, translate triangle **P** 3 squares to the right and 5 squares up. Label the new triangle **R**.

(1)

10. [Edexcel, 2013] Transformations (Mixed) **[5 Marks]**



A1 ANY TRANSLATION

A1 CORRECT POSITION

(a) Describe fully the single transformation that maps shape **P** onto shape **Q**.

A1 ROTATION, 90° ANTICLOCKWISE A1

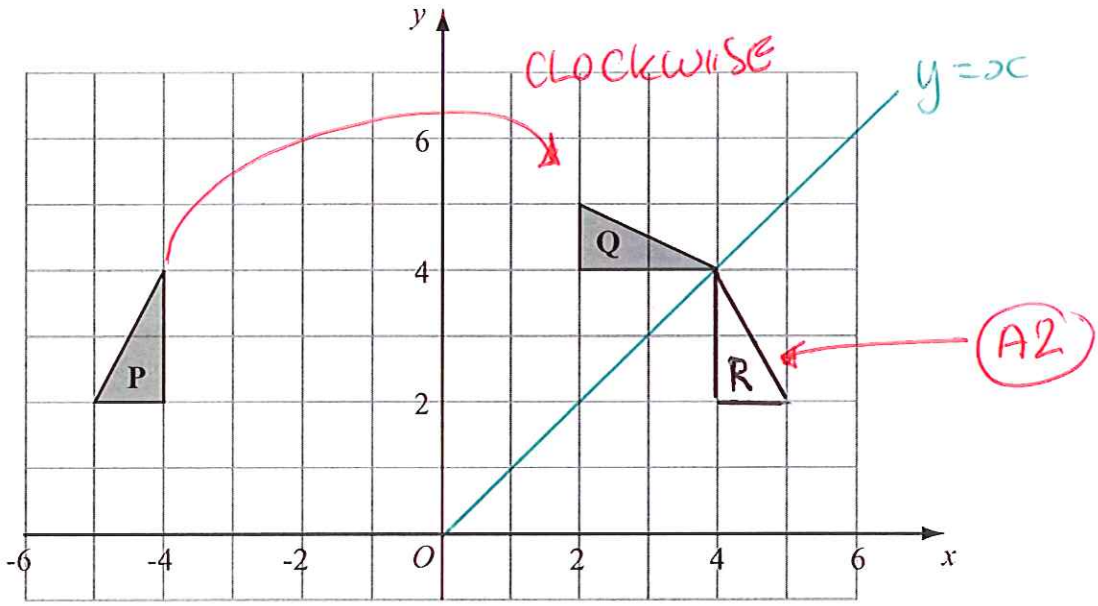
CENTRE AT (0,0) A1

(3)

(b) On the grid, translate shape **P** by the vector $\begin{pmatrix} -6 \\ 2 \end{pmatrix}$ $\begin{pmatrix} x \\ y \end{pmatrix}$
Label the new shape **R**.

(2)

11. [Edexcel, 2011] Transformations (Mixed) **[5 Marks]**



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

ROTATION, 90° CLOCKWISE, A1

A1

CENTRE AT (0,0)

A1

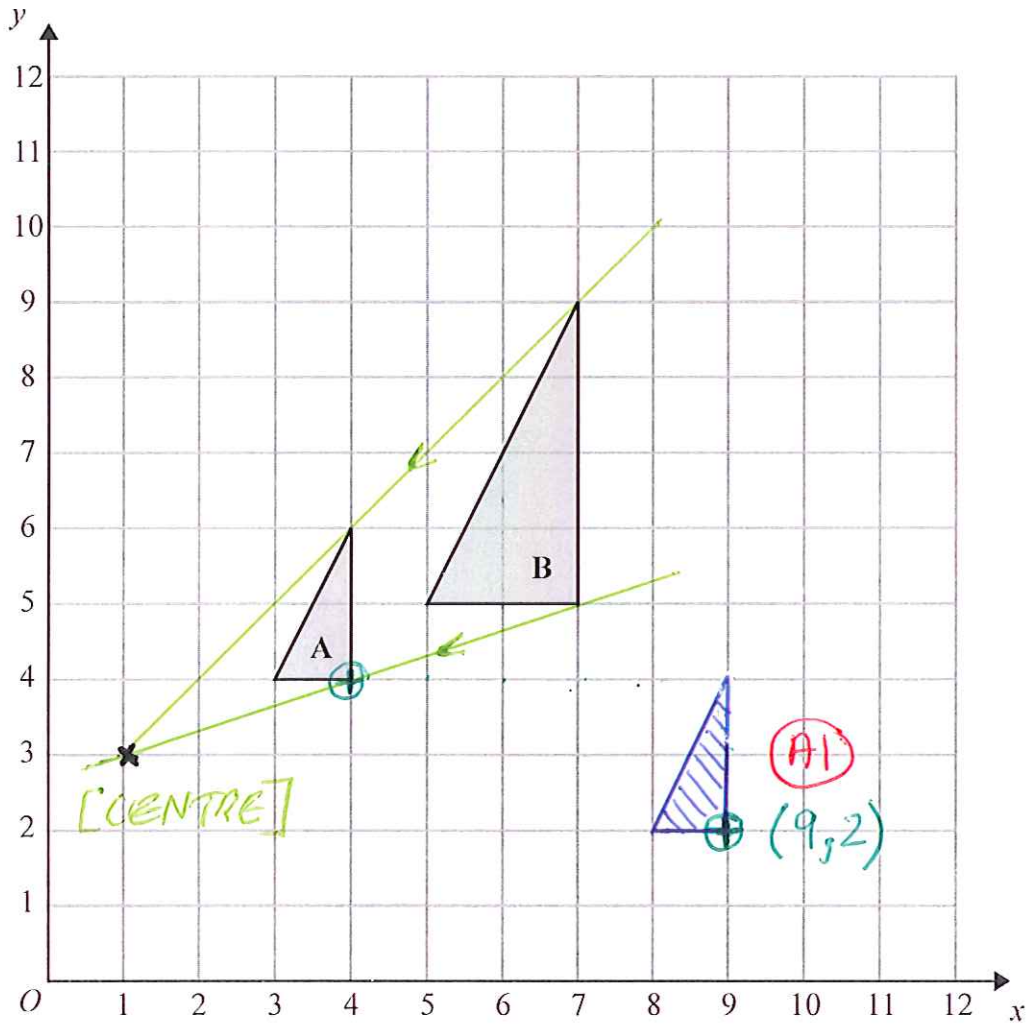
(3)

(b) Reflect triangle **Q** in the line $y = x$.

Label the new triangle **R**.

(2)

12. [Edexcel, 2015] Transformations (Mixed) **[4 Marks]**



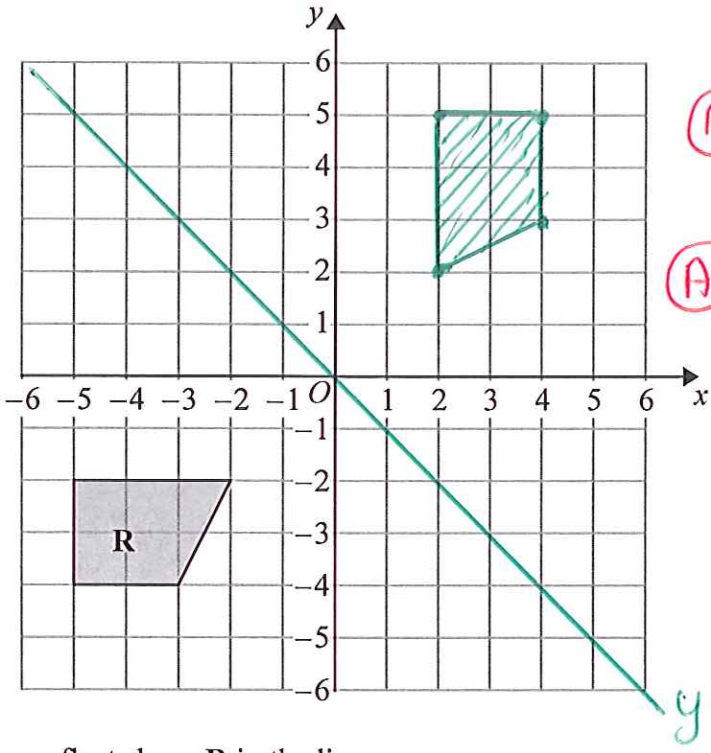
(a) Describe fully the single transformation that maps triangle **A** onto triangle **B**.

ENLARGEMENT, B1
SCALE FACTOR = 2, CENTRE (1,3) B1
B1

(3)

(b) On the grid, translate triangle **A** by the vector $\begin{pmatrix} 5 \\ -2 \end{pmatrix}$

(1)

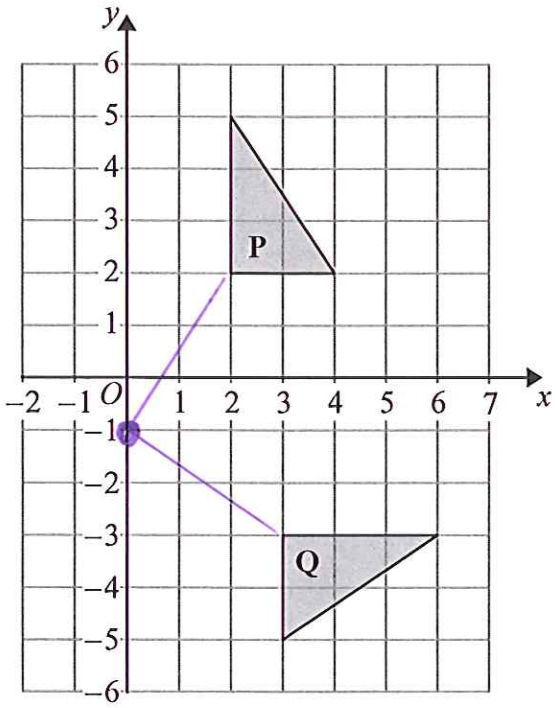


A1 [ANY REFLECTION]

A1 [CORRECT FINISH POSITION]

(a) On the grid above, reflect shape **R** in the line $y = -x$

(2)



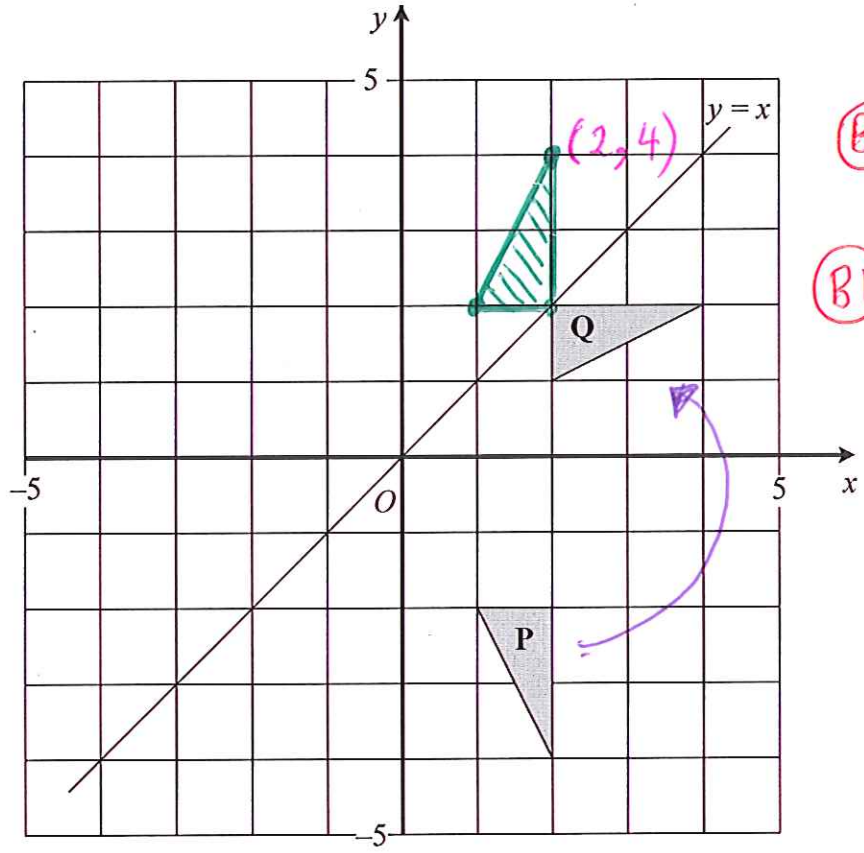
(b) Describe fully the single transformation that maps triangle **P** onto triangle **Q**.

ROTATION, 90° CLOCKWISE, CENTRE (0, −1)

A1 A1 A1

(3)

14. [Edexcel, 2004] Transformations (Mixed) **[5 Marks]**



B1 REFLECTION

B1 POSITION

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

ROTATION, B1 90° ANTI-CLOCKWISE B1

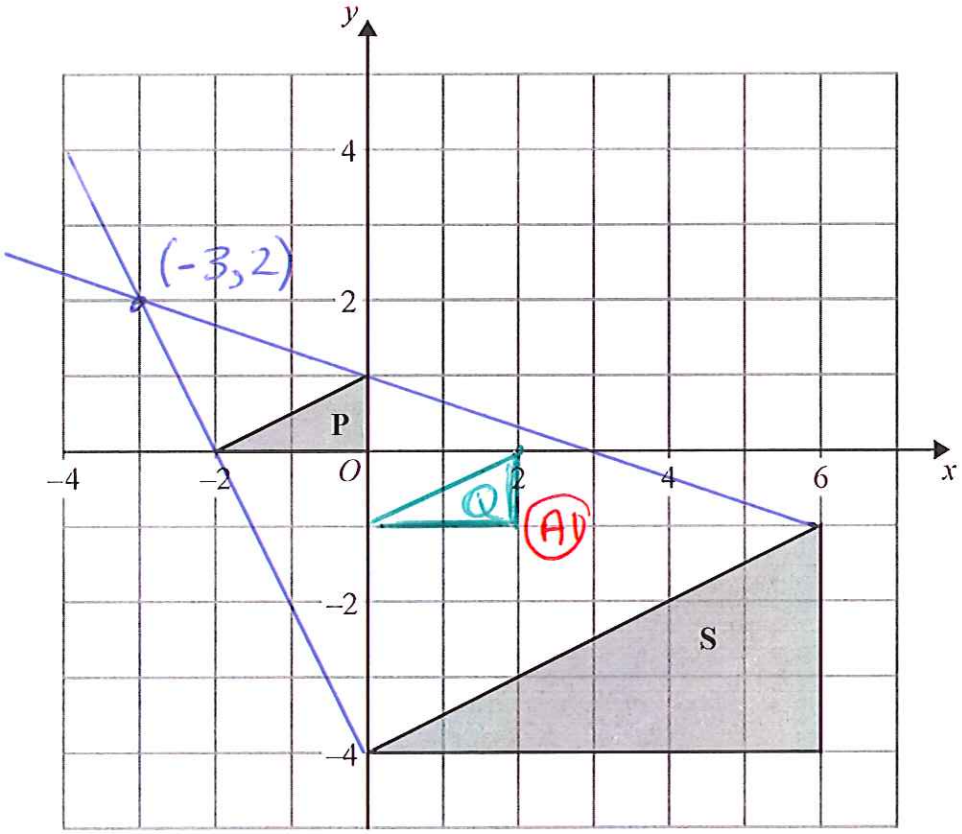
CENTRE IS (0, 0) B1

(3)

(b) Reflect triangle **Q** in the line with equation $y = x$.

(2)

15. [Edexcel, 2014] Transformations (Mixed) **[4 Marks]**



(a) On the grid, translate triangle **P** by the vector $\begin{pmatrix} 2 \\ -1 \end{pmatrix}$

Label the new triangle **Q**.

(1)

(b) Describe fully the single transformation that maps triangle **P** onto triangle **S**.

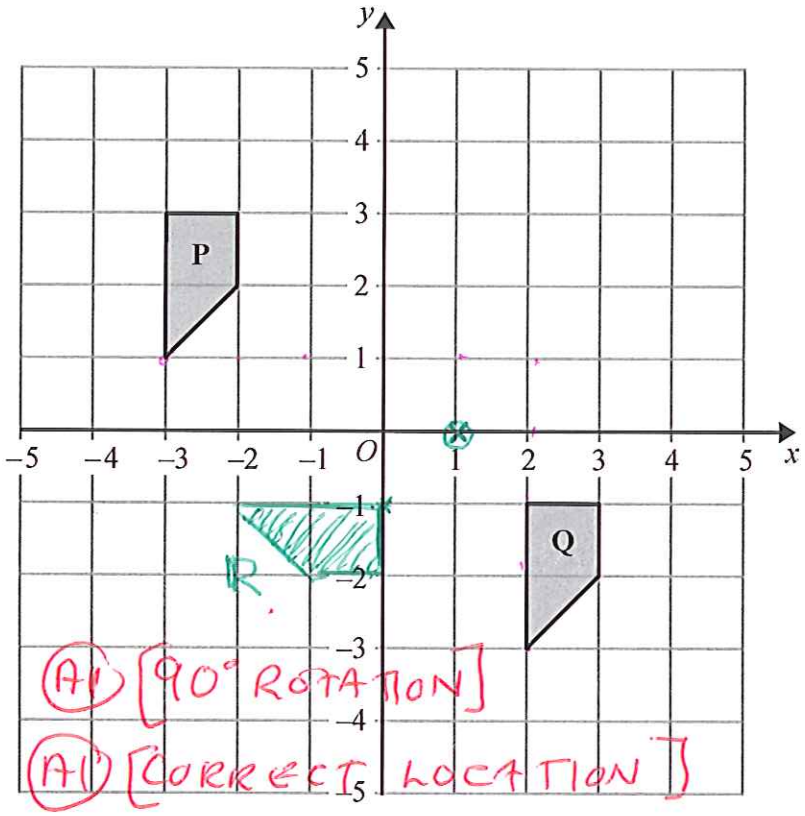
A1 ENLARGEMENT, SCALE FACTOR 3 A1

CENTRE (-3, 2)

A1

(3)

16. [Edexcel, 2016] Transformations (Mixed) **[4 Marks]**



(a) Describe fully the single transformation that maps shape **P** onto shape **Q**.

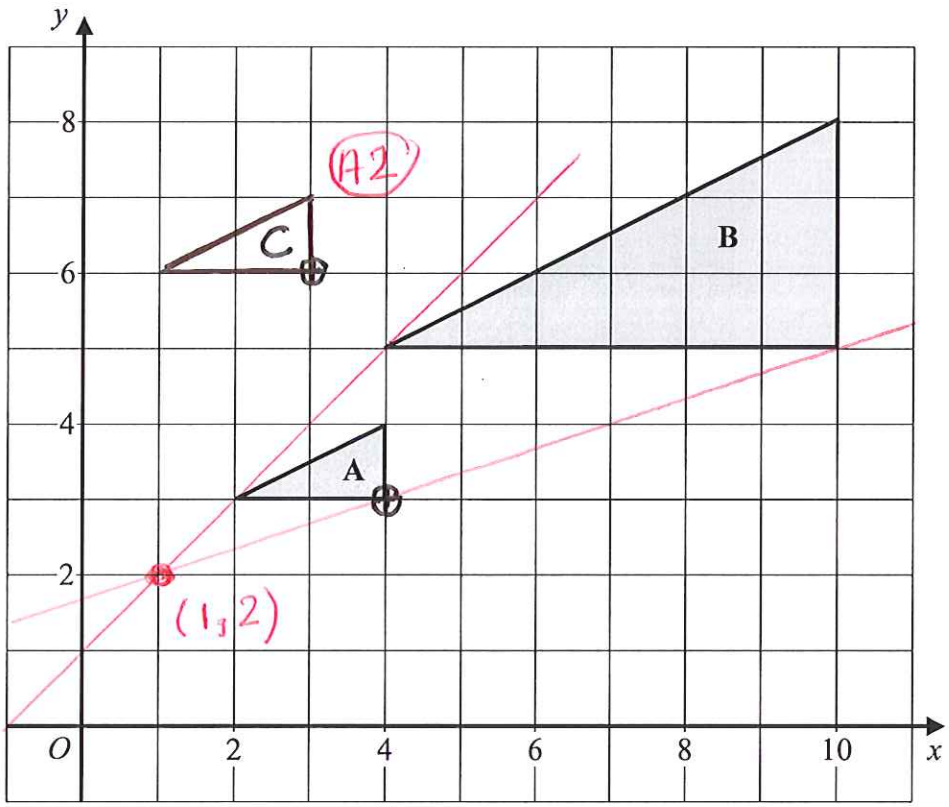
TRANSLATION, BY VECTOR $\begin{pmatrix} 5 \\ -4 \end{pmatrix}$ B1 B1

(2)

(b) Rotate shape **Q** 90° clockwise about (1, 0)
Label the new shape **R**.

(2)

17. [Edexcel, 2006] Transformations (Mixed) **[5 Marks]**



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

A1 ENLARGEMENT, SCALE FACTOR 3 A1

CENTRE (1, 2) A1

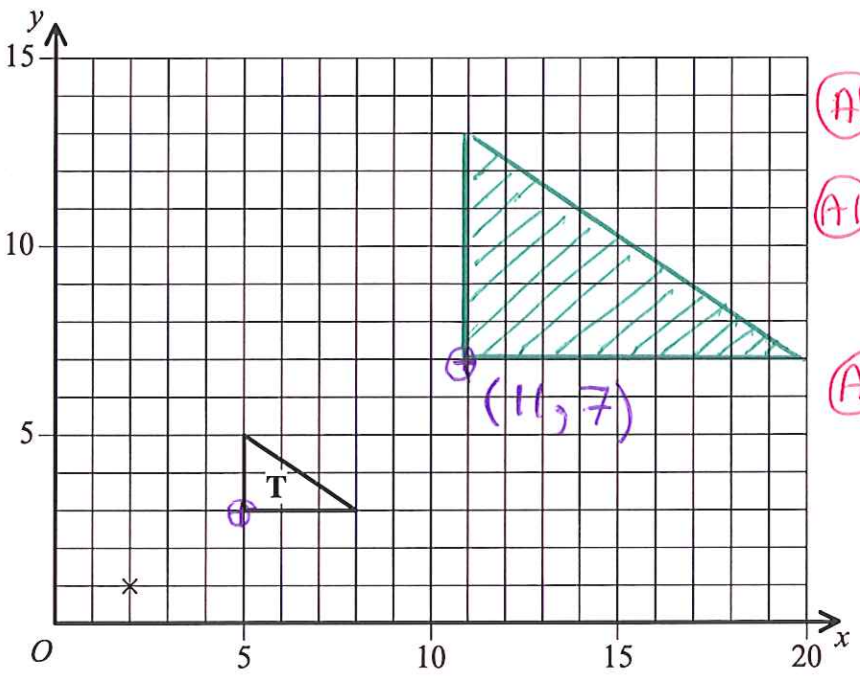
(3)

(b) On the grid, translate triangle **A** by the vector $\begin{pmatrix} -1 \\ 3 \end{pmatrix}$.

Label the new triangle **C**.

(2)

18. [Edexcel, 2005] Transformations (Enlargements) **[3 Marks]**



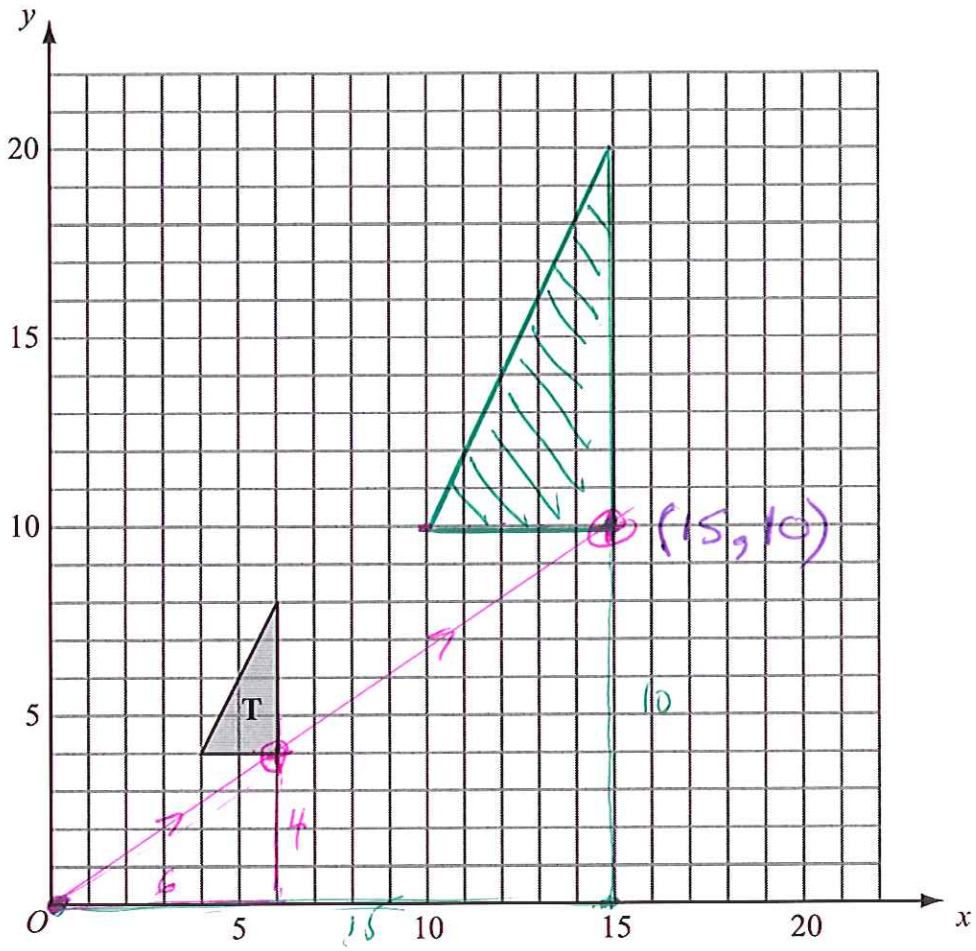
A1 ENLARGEMENT

A1 SCALE FACTOR = 3

A1 POSITION

On the grid, enlarge triangle **T** with a scale factor of 3 and centre (2, 1).

19. [Edexcel, 2009] Transformations (Enlargements) **[3 Marks]**



On the grid, enlarge triangle **T** with a scale factor of $2\frac{1}{2}$ and centre (0, 0).

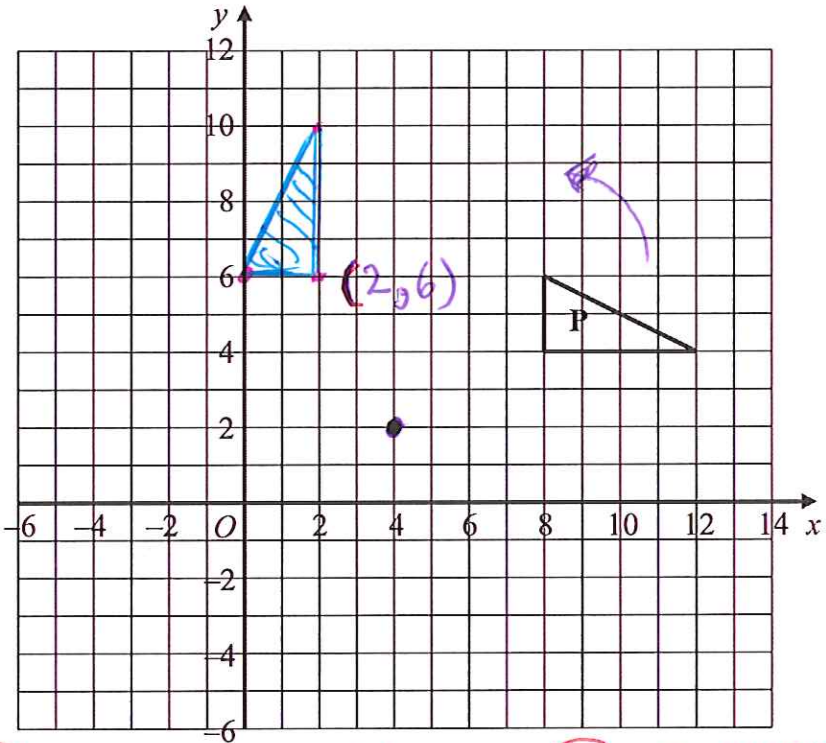
(B1) ANY ENLARGEMENT

(B1) SCALE FACTOR = $2\frac{1}{2}$

(B1) POSITION

20. [Edexcel, 2005] Transformations (Rotations) **[4 Marks]**

(a)

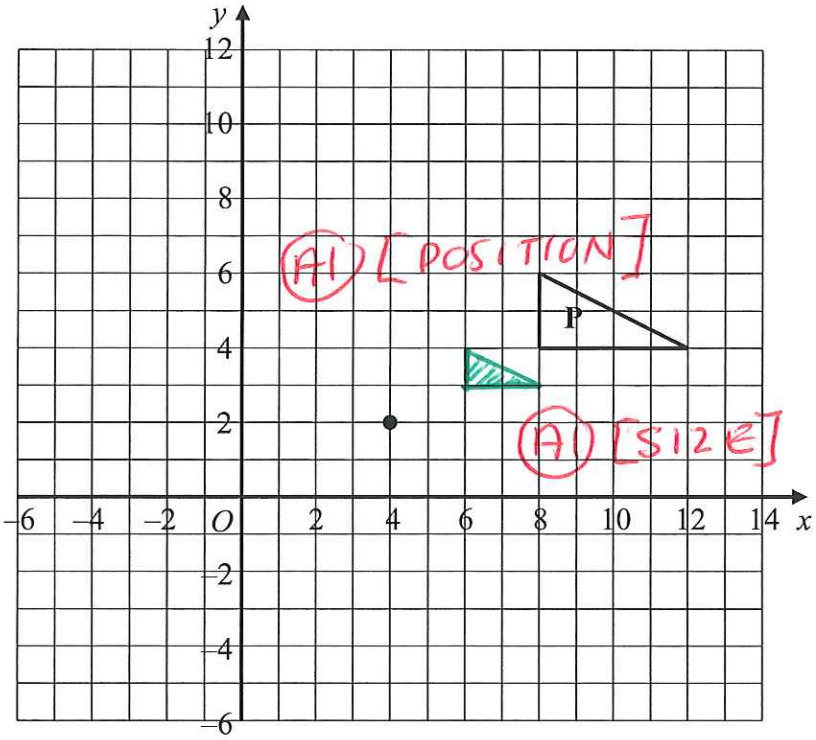


B1 90° ROTATION B1 POSITION

On the grid, rotate triangle **P** 90° anti-clockwise about the point (4, 2).

(2)

(b)



A1 [POSITION] A1 [SIZE]

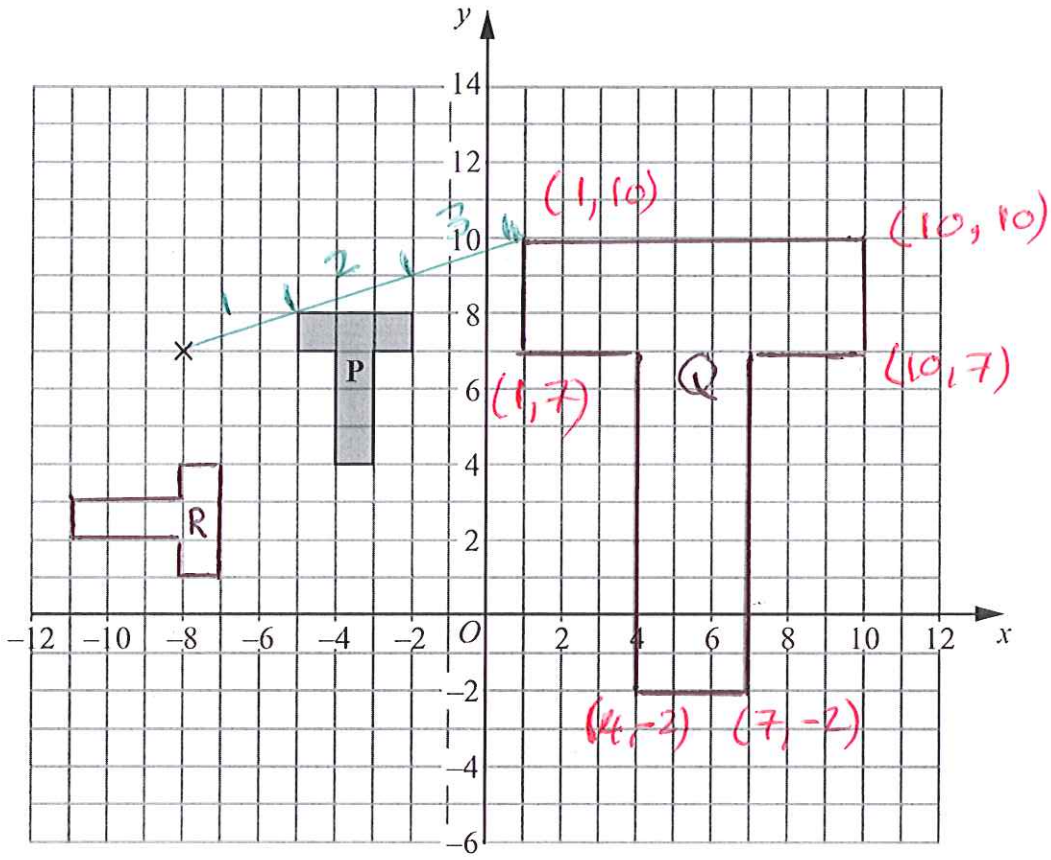
On the grid, enlarge triangle **P** with scale factor $\frac{1}{2}$ and centre (4, 2).

HALF THE SIZE

(2)

(Total 4 marks)

21. [Edexcel, 2013] Transformations (Mixed) **[5 Marks]**



(a) On the grid, enlarge shape **P** with scale factor 3 and centre (−8, 7).
Label the new shape **Q**.

(3)

(b) On the grid, rotate shape **P** through 90° clockwise about the point (−8, 7).
Label the new shape **R**.

(2)

Disclaimer

While reasonable endeavours have been used to verify the accuracy of these solutions, these solutions are provided on an "as is" basis and no warranties are made of any kind, whether express or implied, in relation to these solutions.

There is no warranty that these solutions will meet Your requirements or provide the results which You want, or that they are complete, or that they are error-free. If You find anything confusing within these solutions then it is Your responsibility to seek clarification from Your teacher, tutor or mentor.

Please report any errors or omissions that You find*. These solutions will be updated to correct errors that are discovered. It is recommended that You always check that You have the most up-to-date version of these solutions.

The methods used in these solutions, where relevant, are methods which have been successfully used with students. The method shown for a particular question is not always the only method and there is no claim that the method that is used is necessarily the most efficient or 'best' method. From time to time, a solution to a question might be updated to show a different method if it is judged that it is a good idea to do so.

Sometimes a method used in these solutions might be unfamiliar to You. If You are able to use a different method to obtain the correct answer then You should consider to keep using your existing method and not change to the method that is used here. However, the choice of method is always up to You and it is often useful if You know more than one method to solve a particular type of problem.

Within these solutions there is an indication of where marks **might** be awarded for each question. B marks, M marks and A marks have been used in a similar, but **not identical**, way that an exam board uses these marks within their mark schemes. This slight difference in the use of these marking symbols has been done for simplicity and convenience. Sometimes B marks, M marks and A marks have been interchanged, when compared to an examiners' mark scheme and sometimes the marks have been awarded for different aspects of a solution when compared to an examiners' mark scheme.

B1 – This is an unconditional accuracy mark (the specific number, word or phrase must be seen. This type of mark cannot be given as a result of 'follow through').

M1 – This is a method mark. Method marks have been shown in places where they might be awarded for the method that is shown. If You use a different method to get a correct answer, then the same number of method marks would be awarded but it is not practical to show all possible methods, and the way in which marks might be awarded for their use, within these particular solutions. When appropriate, You should seek clarity and download the relevant examiner mark scheme from the exam board's web site.

A1 – These are accuracy marks. Accuracy marks are typically awarded after method marks. If the correct answer is obtained, then You should normally (but not always) expect to be awarded all of the method marks (provided that You have shown a method) and all of the accuracy marks.

Note that some questions contain the words 'show that', 'show your working out', or similar. These questions require working out to be shown. Failure to show sufficient working out is likely to result in no marks being awarded, even if the final answer is correct.

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