

Transformations

Exam questions

Foundation and Higher tiers

Please write clearly in block capitals.

Name

Class

Teacher

Time allowed: 40 minutes

Materials

For this booklet you need a black pen, a pencil, a ruler, a rubber, tracing paper and a calculator for Section B.

Instructions

- Use black ink or black ballpoint pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer all questions in the spaces provided.
- **Section A** (questions 1 to 13): you must not use a calculator.
- **Section B** (questions 14 and 15): you may use a calculator.
- Do all rough work in this booklet. Cross through any work you do not want marked.

Information

- The marks for each question are shown in brackets.
- The maximum mark for this booklet is 36.

Advice

- Read each question carefully.
- In all calculations, show clearly how you work out your answer.

For teacher's use

Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
TOTAL	

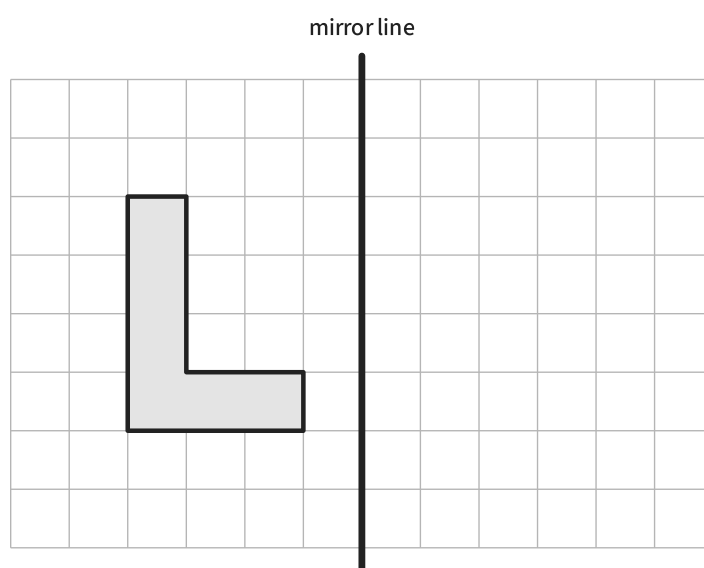
Section A



You must not use a calculator

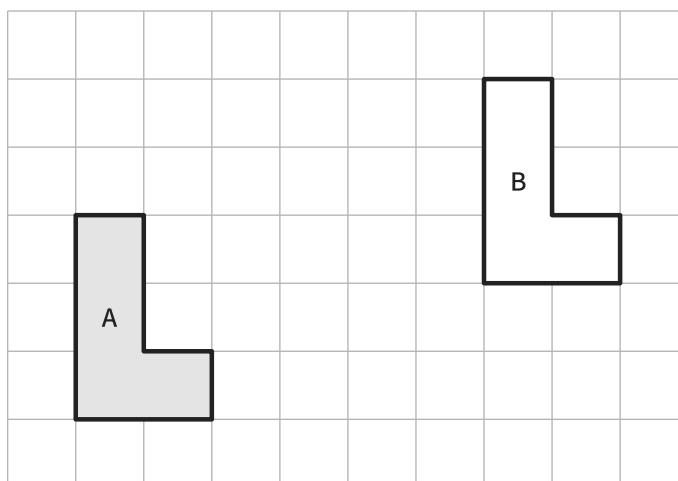
Do not
write
outside
the box

- 1** Reflect the shape in the mirror line.



[2 marks]

- 2** Circle the single transformation that maps shape A onto shape B.



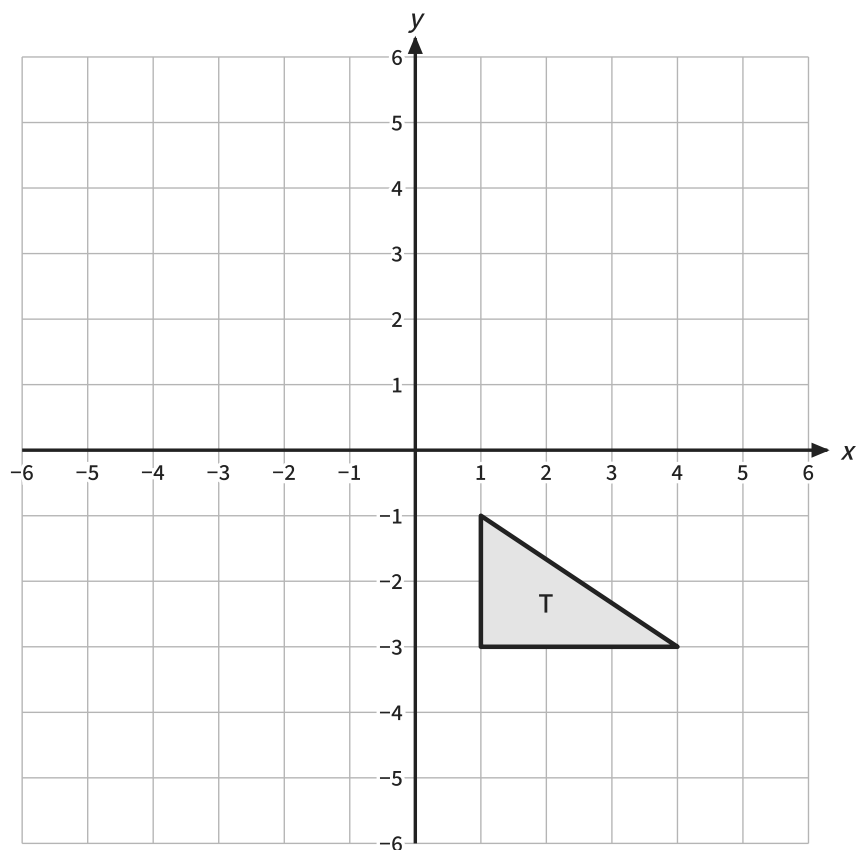
reflection rotation translation enlargement

[1 mark]

3

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

Do not
write
outside
the box



[2 marks]

4

(a) Shape P is translated by the vector $\begin{pmatrix} 3 \\ -2 \end{pmatrix}$ to give shape Q.

Write down the vector of the translation that maps shape Q to shape P.

Answer _____

[1 mark]

(b) The point (4, 7) is translated by the vector $\begin{pmatrix} -6 \\ 3 \end{pmatrix}$

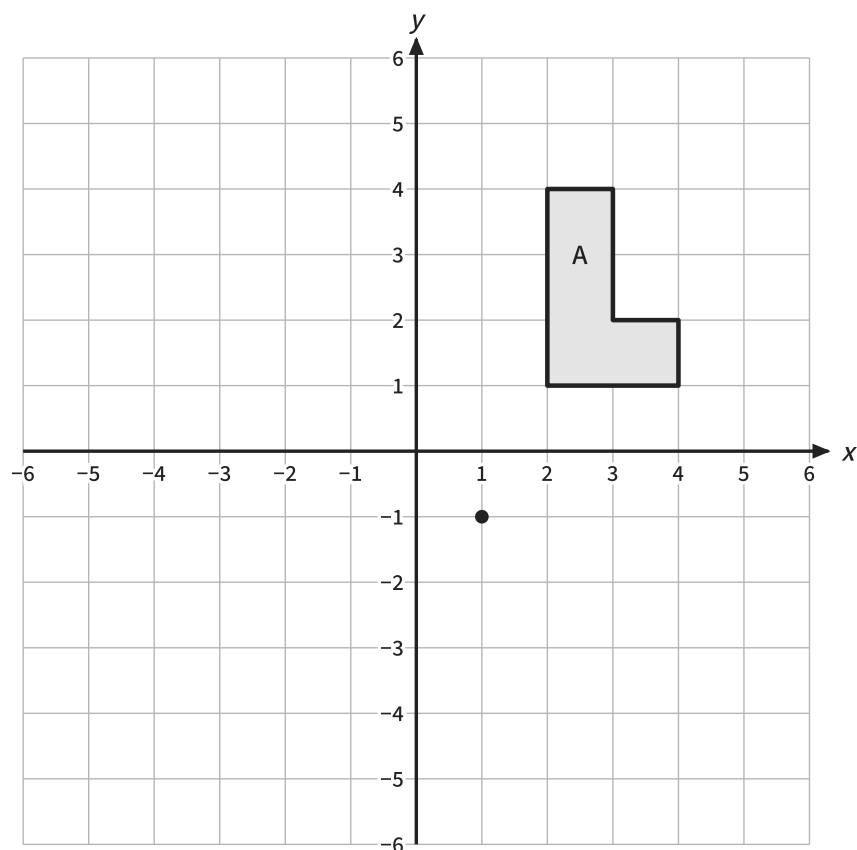
Write down the coordinates of its image.

Answer _____

[1 mark]

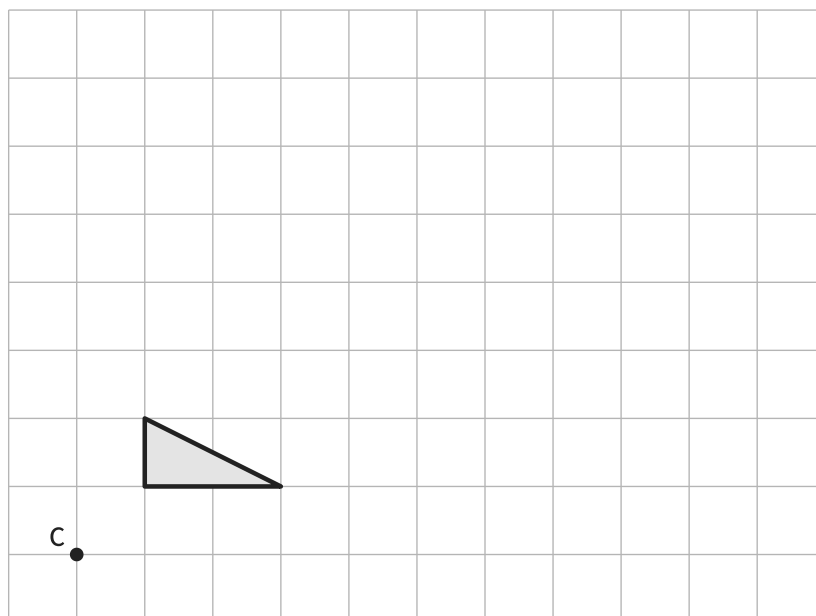
- 5 Rotate shape A 90° clockwise about $(1, -1)$

Do not
write
outside
the box



[2 marks]

- 6 Enlarge the triangle by scale factor 3, centre C.



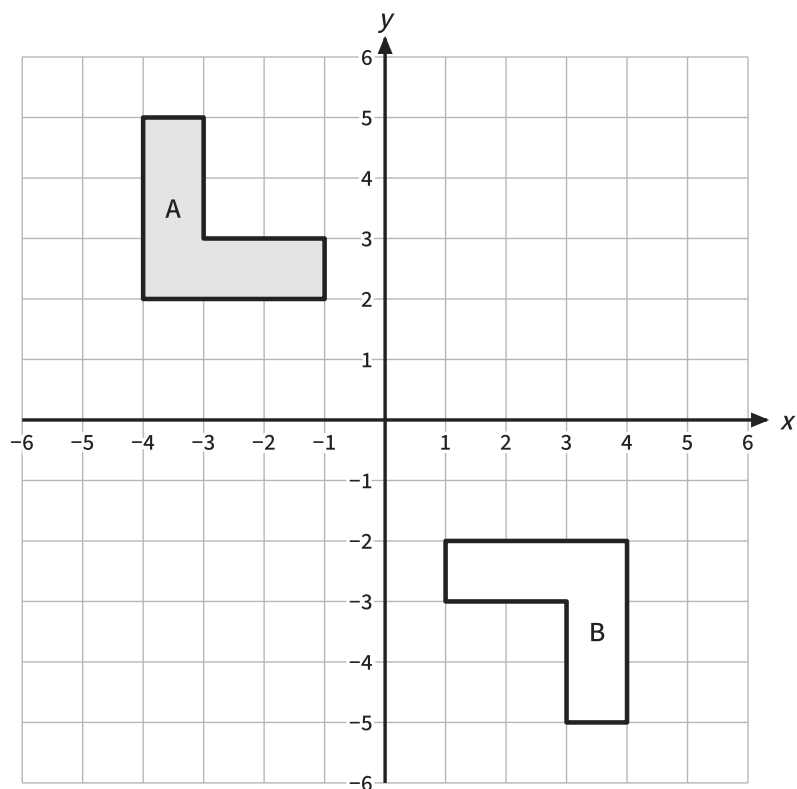
[2 marks]

7

Shape B is the image of shape A after a single transformation.

Do not
write
outside
the box

- (a) Reflect shape A in the line $y = 1$
Label the image C.



[1 mark]

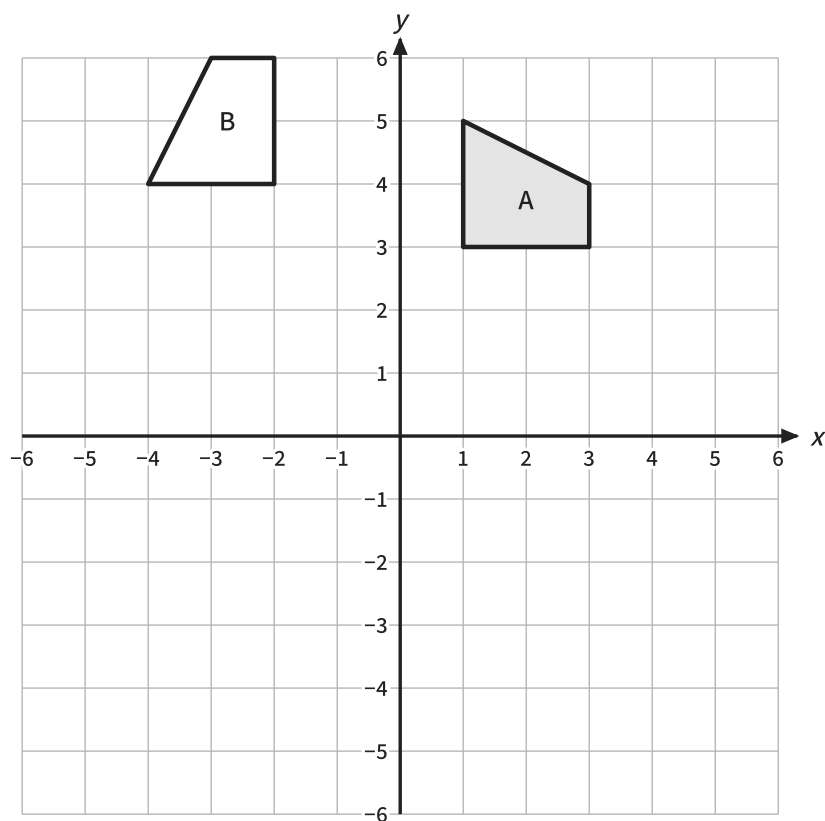
- (b) Ana says,
“Shape B is a reflection of shape A in the line $y = 1$ ”
Explain why Ana is wrong.

[1 mark]

8

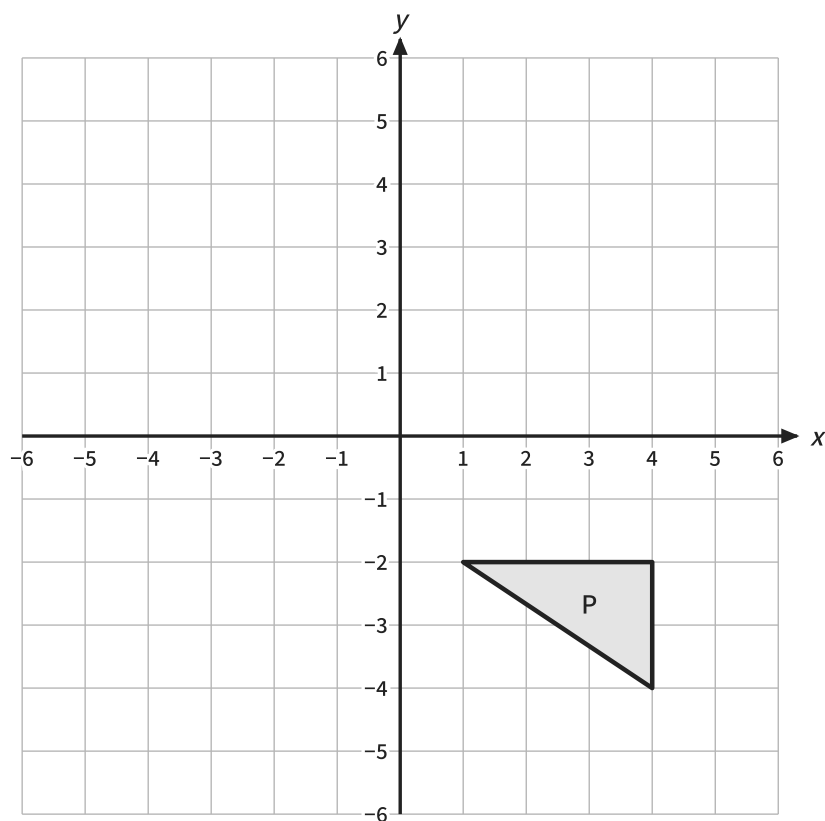
Describe fully the single transformation that maps shape A onto shape B.

Do not
write
outside
the box



Answer _____

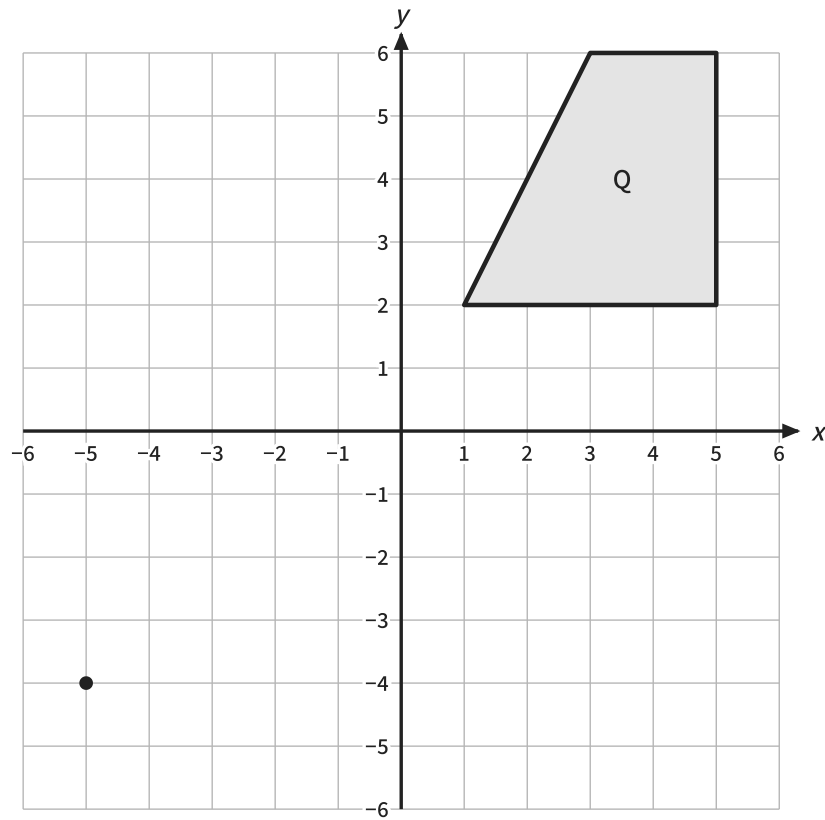
[3 marks]

9 Reflect triangle P in the line $y = x$ Do not
write
outside
the box**[2 marks]**

10

Enlarge shape Q by scale factor $\frac{1}{2}$, centre $(-5, -4)$

Do not
write
outside
the box

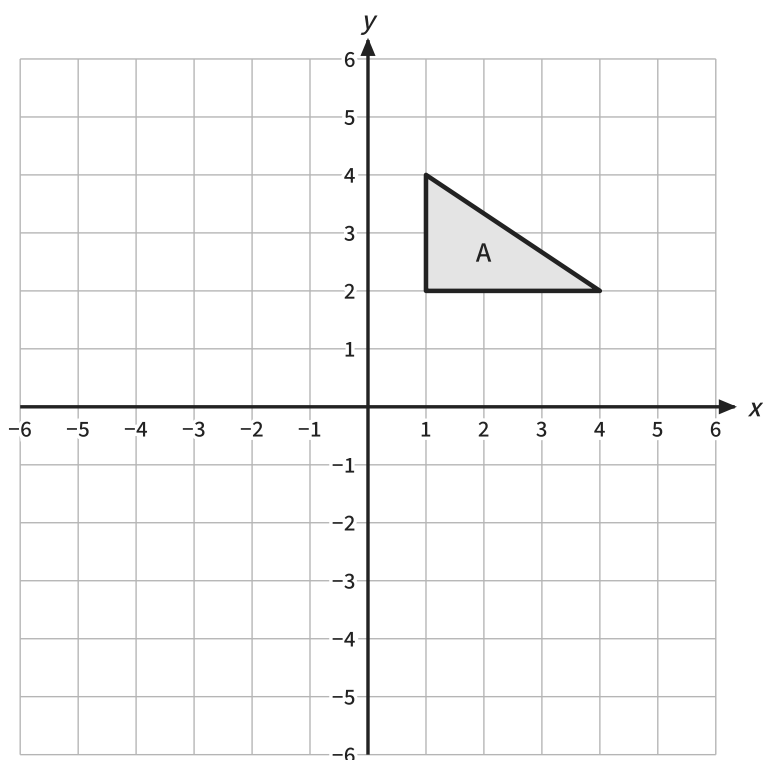


[2 marks]

11

- (a) Reflect triangle A in the x -axis. Label the image B.
Then rotate triangle B 90° clockwise about $(0, 0)$. Label the image C.

Do not
write
outside
the box



[2 marks]

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

Answer _____

[2 marks]

12

Kai says,

“A rotation of 180° about $(0, 0)$ followed by a reflection in the x -axis is the same as a reflection in the y -axis.”

- (a)** Is Kai correct?
You must show your working.

[2 marks]

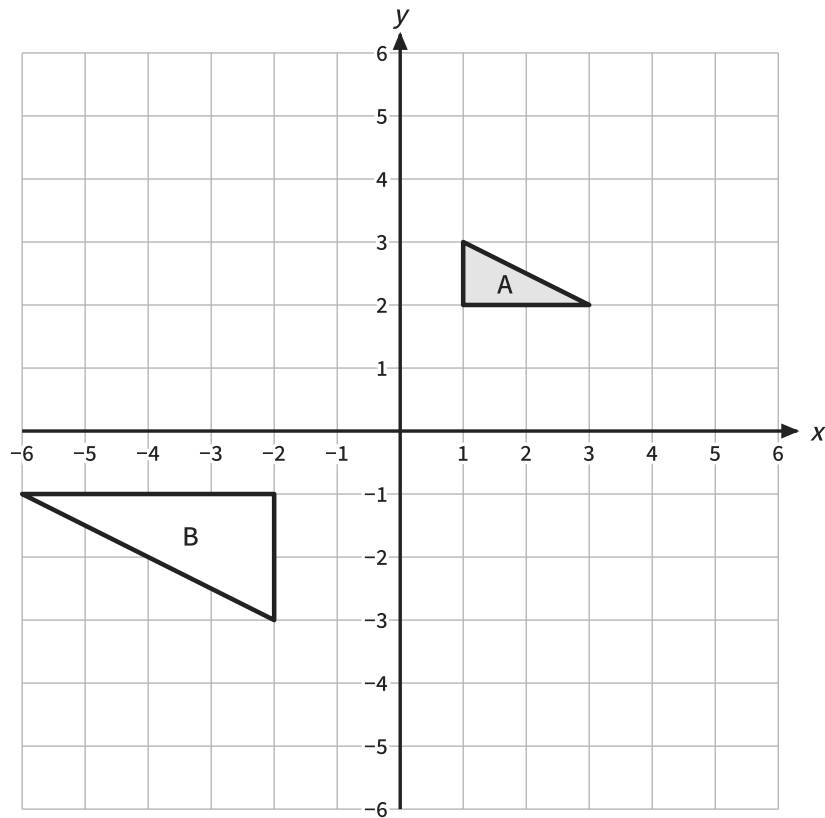
- (b)** Write down the coordinates of a point that is invariant under Kai's combination of transformations.

Answer _____

[1 mark]

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

Do not
write
outside
the box



Answer _____

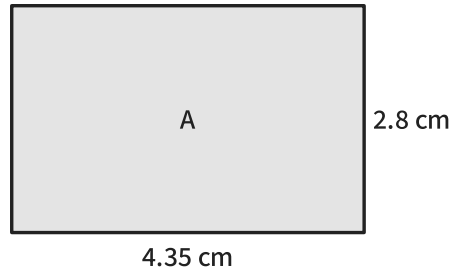
[3 marks]

Section B

You may use a calculator

Do not
write
outside
the box

- 14** Rectangle A is 4.35 cm long and 2.8 cm wide.
Rectangle A is enlarged by scale factor 3 to give rectangle B.



Not drawn accurately

- (a)** Work out the length of rectangle B.

Answer _____ cm

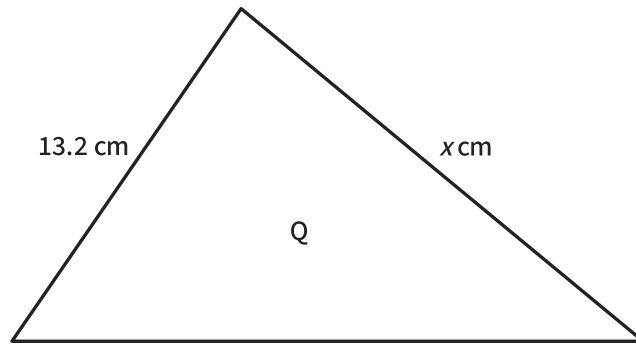
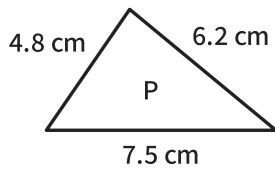
[1 mark]

- (b)** Work out the perimeter of rectangle B.

Answer _____ cm

[2 marks]

- 15 Triangle Q is an enlargement of triangle P.



Not drawn accurately

Work out the value of x .

Answer _____ cm

[3 marks]

END OF QUESTIONS

Do not
write
outside
the box