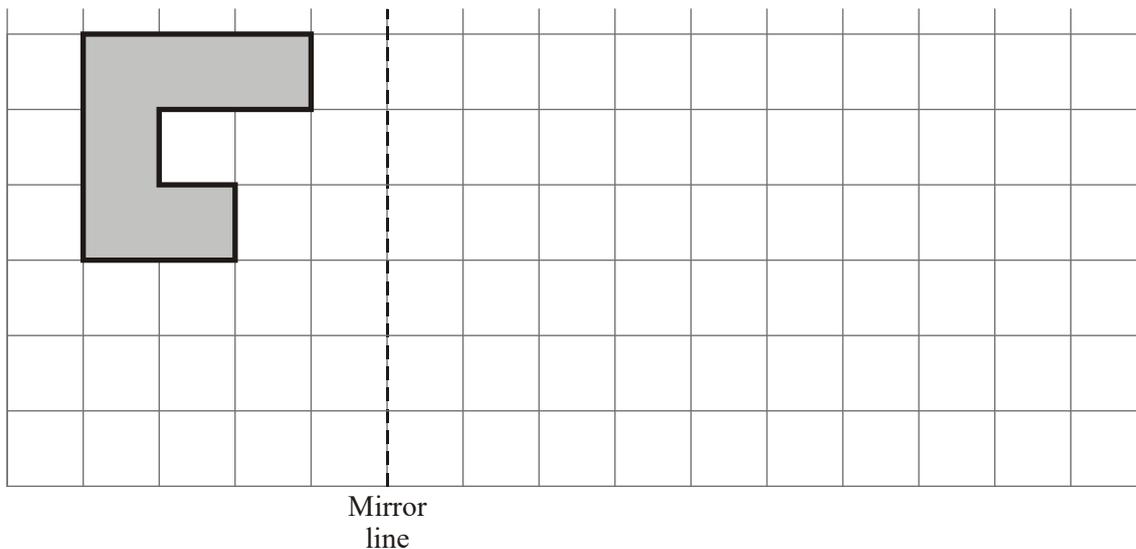


1. A shaded shape is shown on the grid of centimetre squares.



- (a) Work out the perimeter of the shaded shape.

.....cm (1)

- (b) Work out the area of the shaded shape.

.....cm² (1)

- (c) Reflect the shaded shape in the mirror line.

(2)
(Total 4 marks)

2. Here is a list of 8 numbers.

11 16 18 36 68 69 82 88

(a) Write down **two** numbers from the list with a sum of 87

..... ,

(1)

(b) Write down a number from the list which is

(i) a multiple of 9,

.....

(ii) a square number.

.....

(2)

cube	multiple	factor	product
------	----------	--------	---------

(c) Use a word from the box to complete this sentence correctly.

11 is a of 88

(1)

Here are the same 8 numbers drawn larger.

11 16 18 36
68 69 82 88

(d) From these numbers, write down a number which has

(i) exactly **one** line of symmetry,

.....

(ii) 2 lines of symmetry **and** rotational symmetry of order 2,

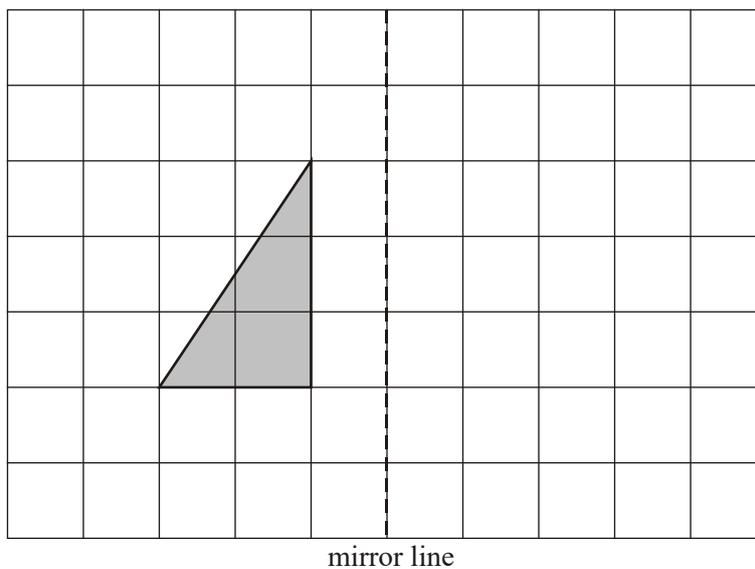
.....

(iii) rotational symmetry of order 2 but **no** lines of symmetry.

.....

(3)
(Total 7 marks)

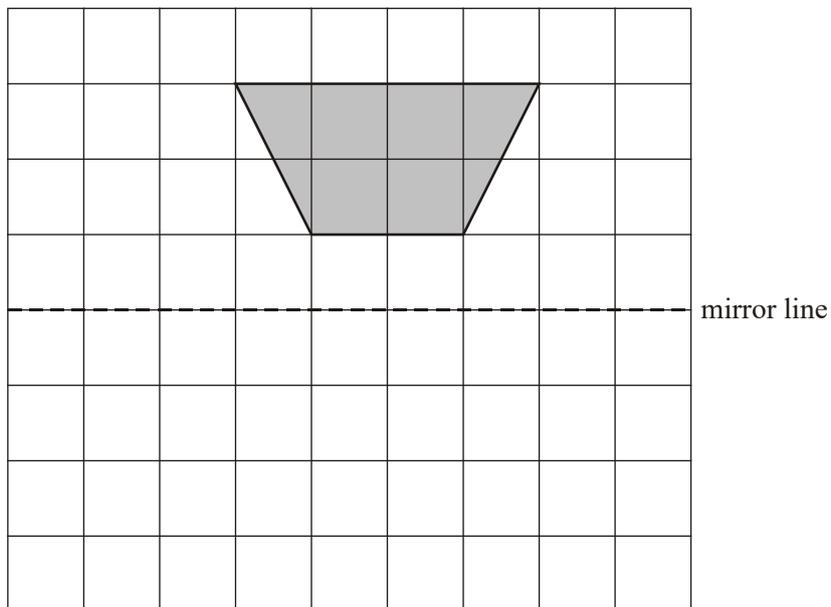
3. (a)



Reflect the shaded shape in the mirror line.

(1)

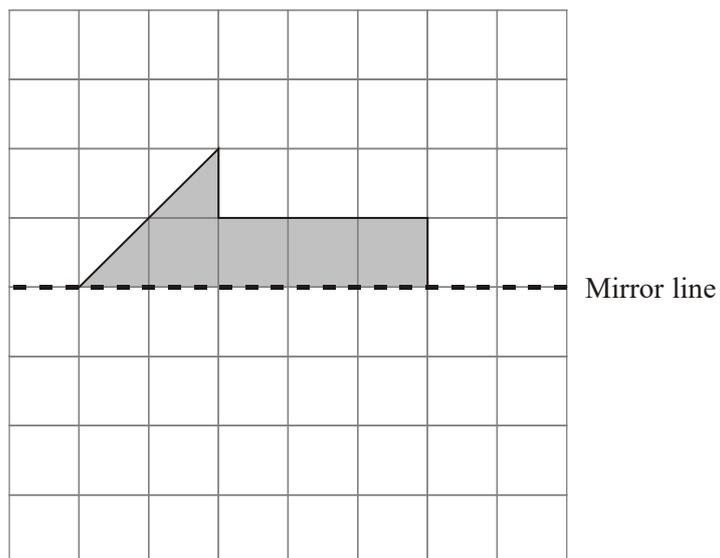
(b)



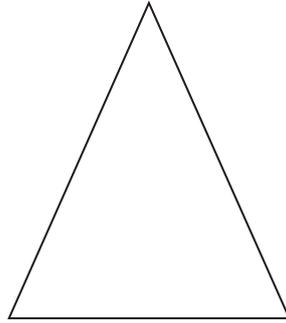
Reflect the shaded shape in the mirror line.

(1)
(Total 2 marks)

4.



- (a) Reflect the shaded shape in the mirror line.



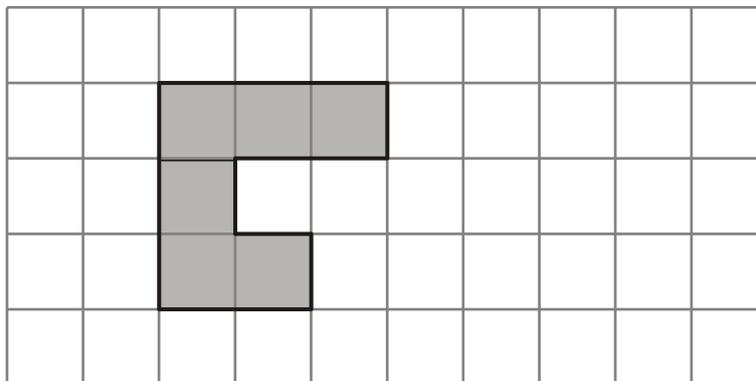
(1)

- (b) Draw the line of symmetry on this triangle.

(1)

(Total 2 marks)

5.



The shaded shape is drawn on a grid of centimetre squares.

- (a) Find the perimeter of the shaded shape.

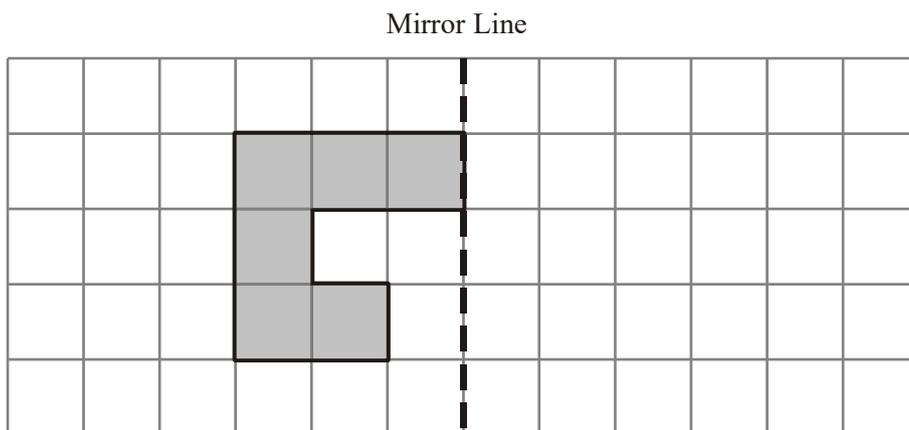
..... cm

(1)

- (b) Find the area of the shaded shape.

..... cm²

(1)



(c) Reflect the shaded shape in the mirror line.

(1)

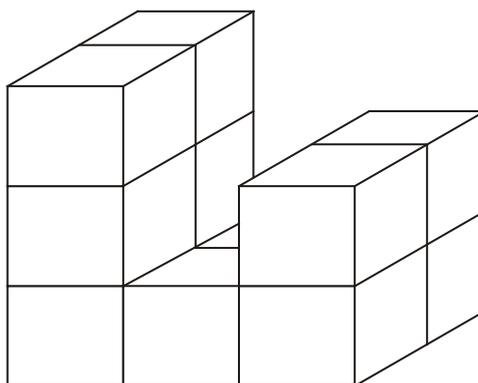


Diagram **NOT** accurately drawn

Here is a prism made of centimetre cubes.

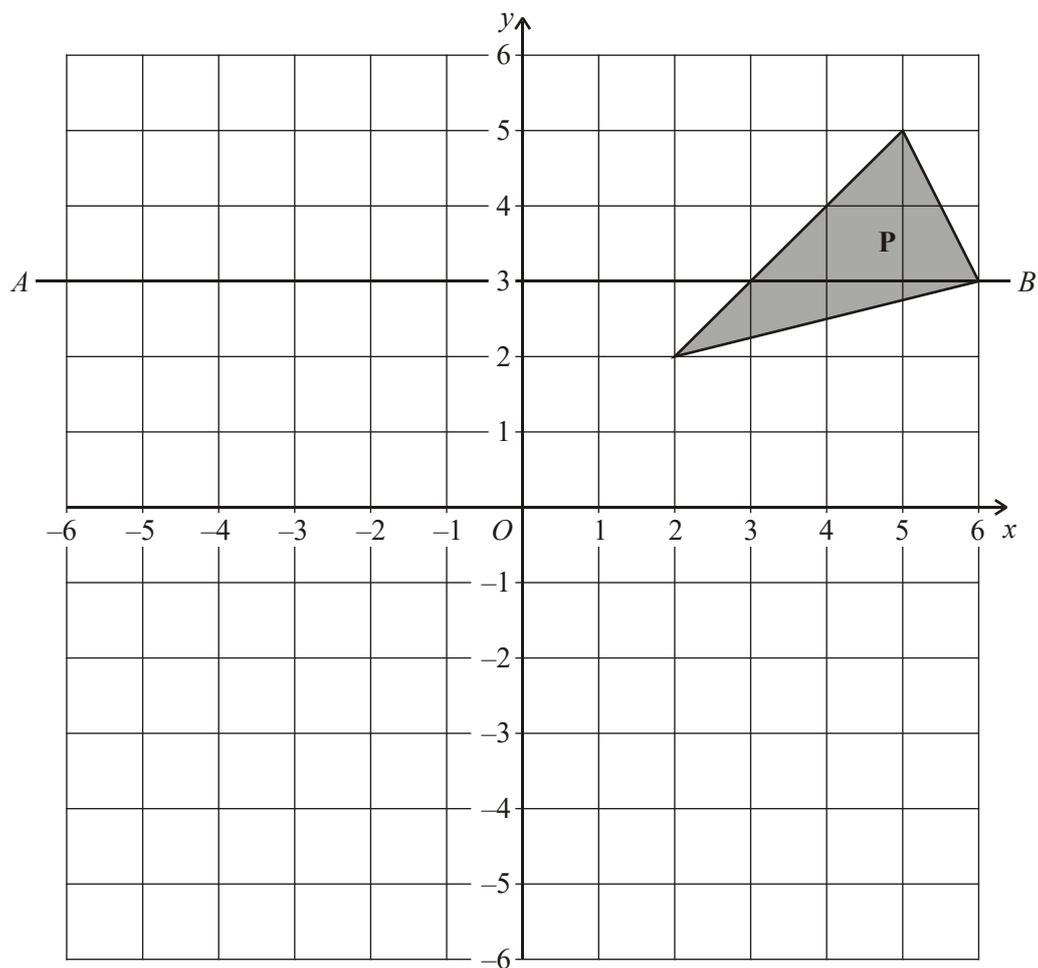
(d) Find the volume of the prism.

..... cm³

(1)

(Total 4 marks)

6.



- (a) On the grid, reflect triangle P in the y -axis.
Label the new shape, Q .

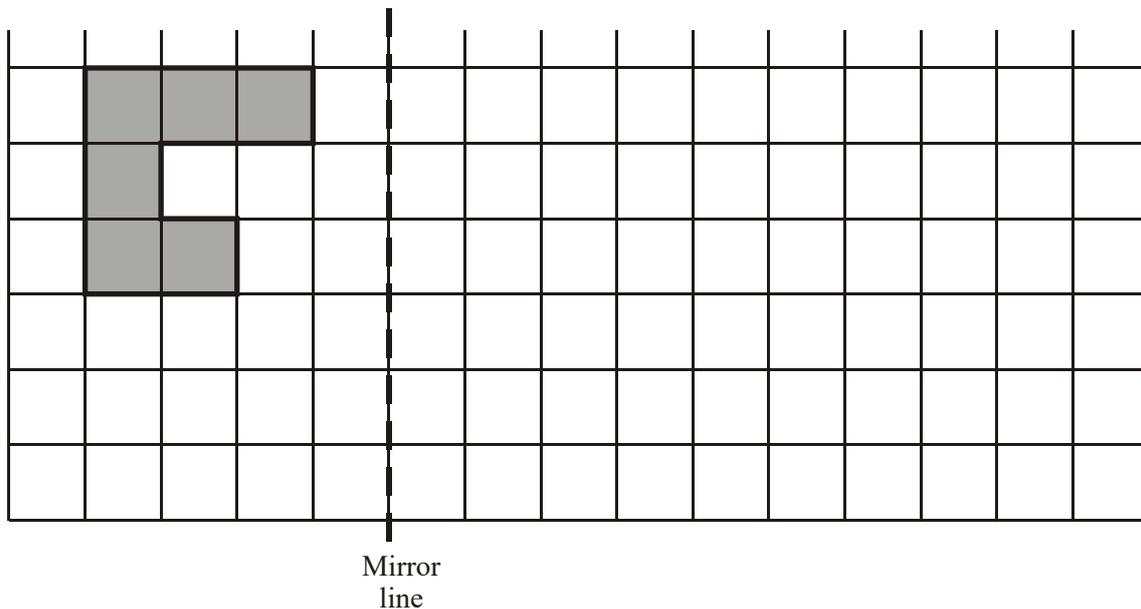
(1)

The line AB is drawn on the grid.

- (b) On the grid, reflect triangle P in the line AB .
Label the new shape, R .

(1)
(Total 2 marks)

7. A shaded shape is shown on the grid of centimetre squares.



(a) Work out the perimeter of the shaded shape.

..... cm (1)

(b) Work out the area of the shaded shape.

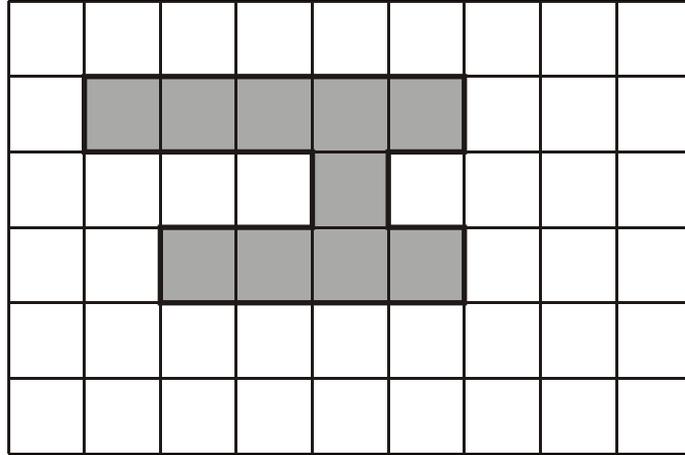
..... cm² (1)

(c) On the grid above, reflect the shaded shape in the mirror line.

(2)

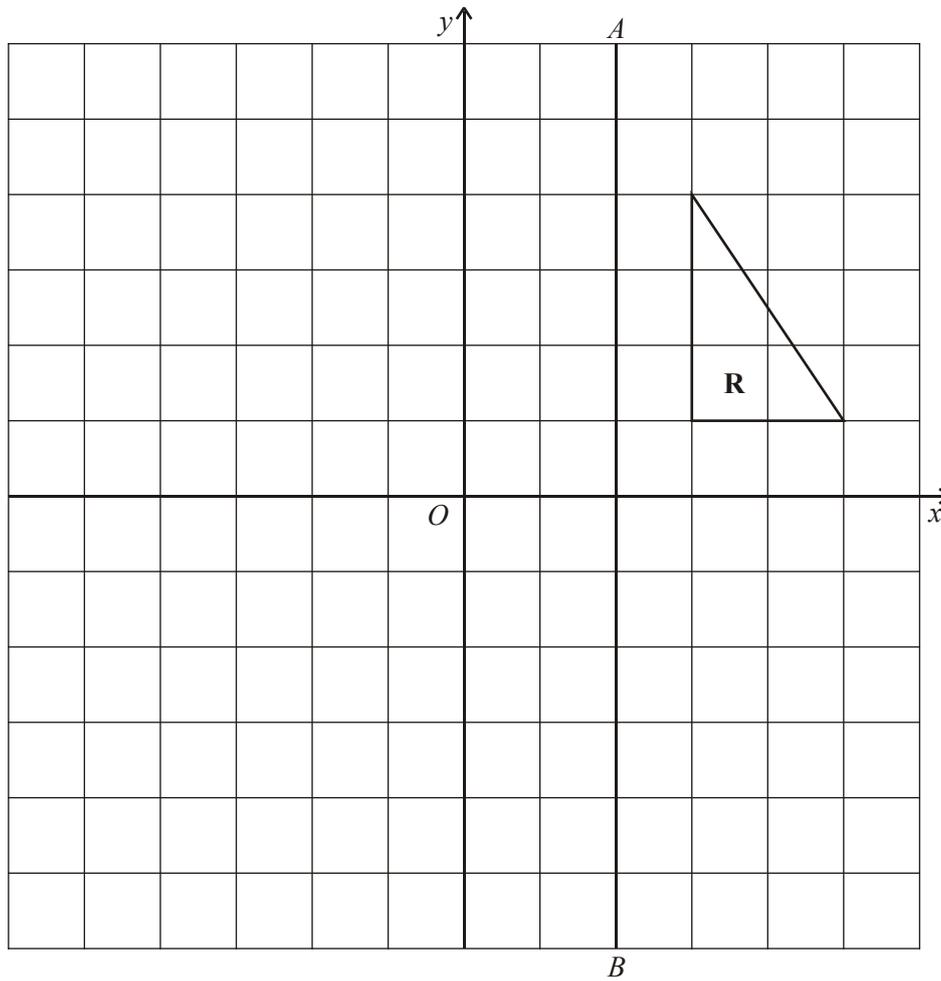
On the grid below, 10 squares are shaded.

(d) Shade **one** extra square so that the shaded shape has **one** line of symmetry.



(1)
(Total 5 marks)

8.



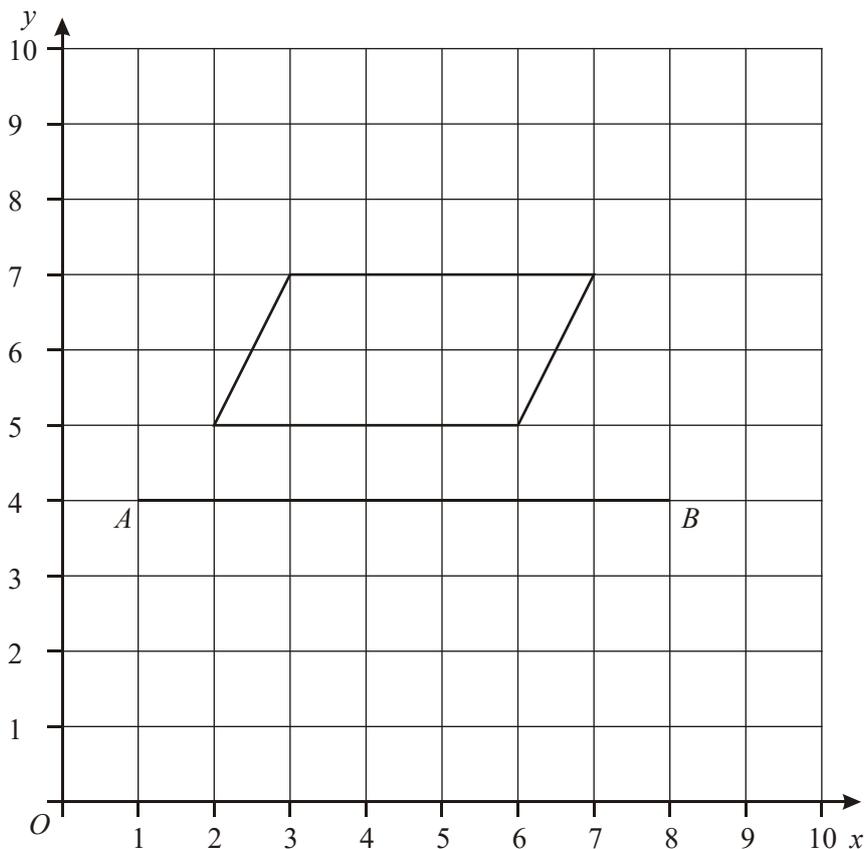
- (a) Reflect triangle **R** in the line AB .
Label the new triangle **S**.

(1)

- (b) Rotate triangle **R** a half turn about the point O .
Label the new triangle **T**.

(2)
(Total 3 marks)

9. A quadrilateral is shown on the grid.



(a) Write down the mathematical name of this quadrilateral.

.....

(1)

(b) Reflect the quadrilateral in the line AB .

(2)

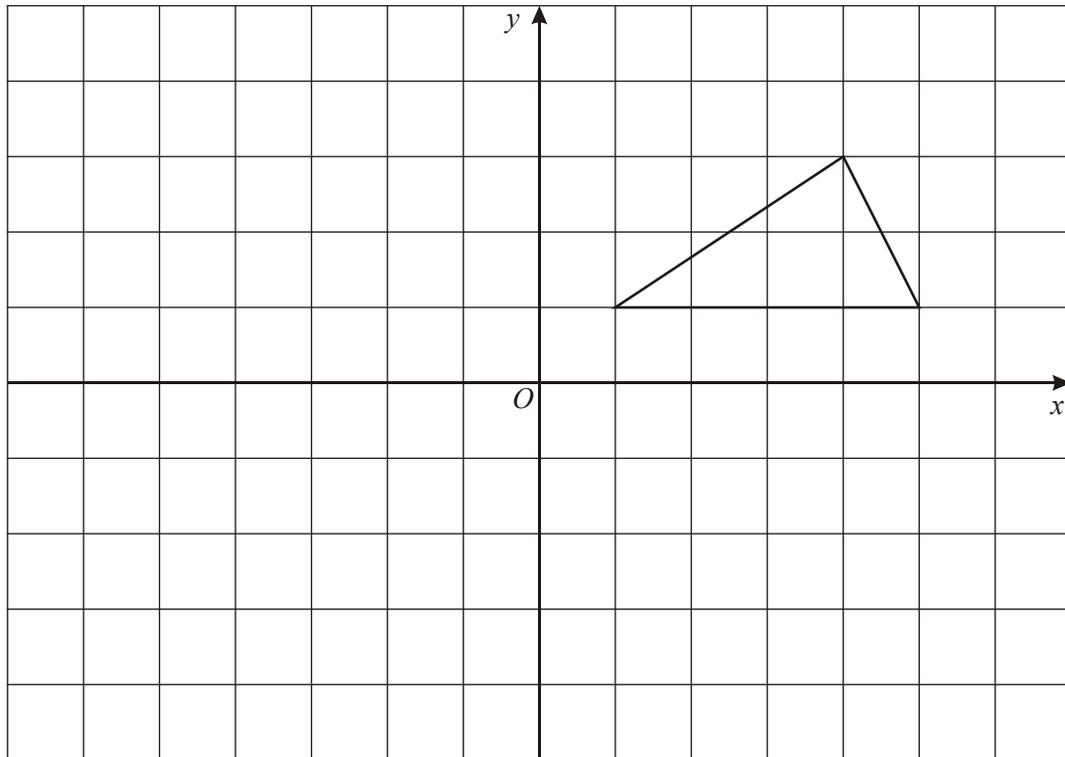
(c) Write down the coordinates of the point B .

(.....,

(1)

(Total 4 marks)

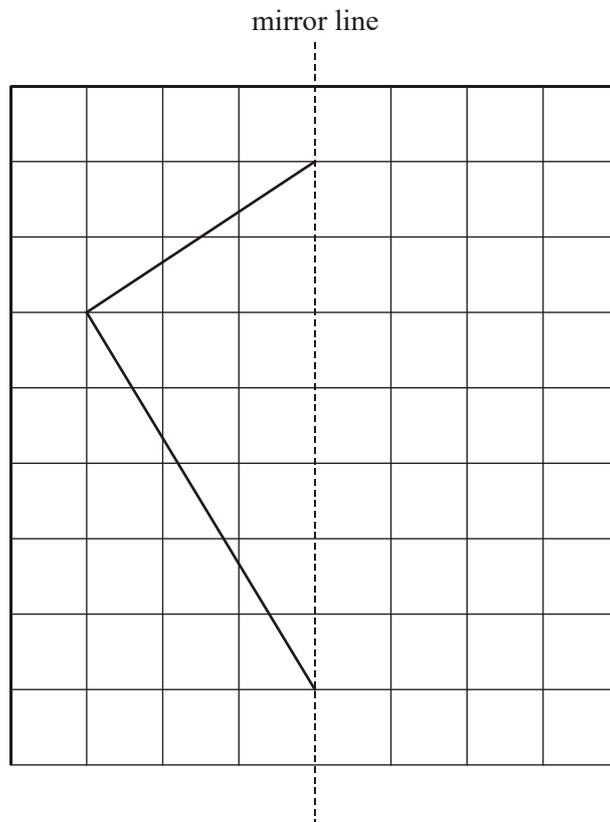
10.



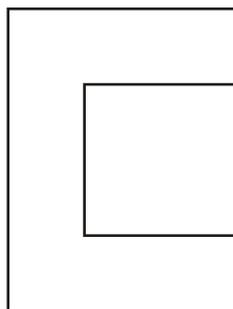
Reflect the triangle in the x -axis.

(Total 1 mark)

11.



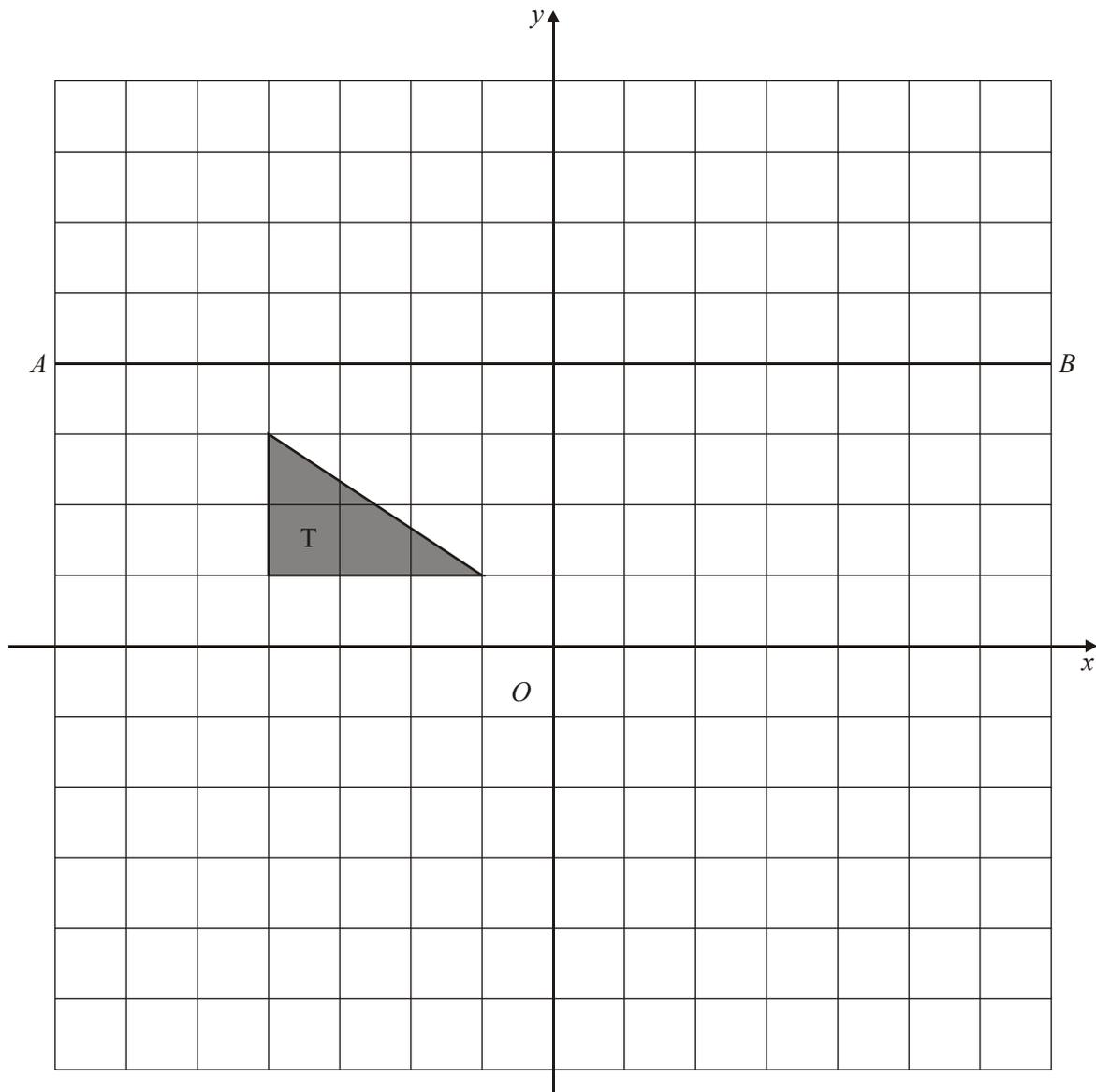
- (i) Draw the reflection of the shape above in the mirror line.



- (ii) Draw in the line of symmetry of this shape.

(Total 2 marks)

12.



- (a) Reflect triangle **T** in the line *AB*.
Label the new triangle **P**.

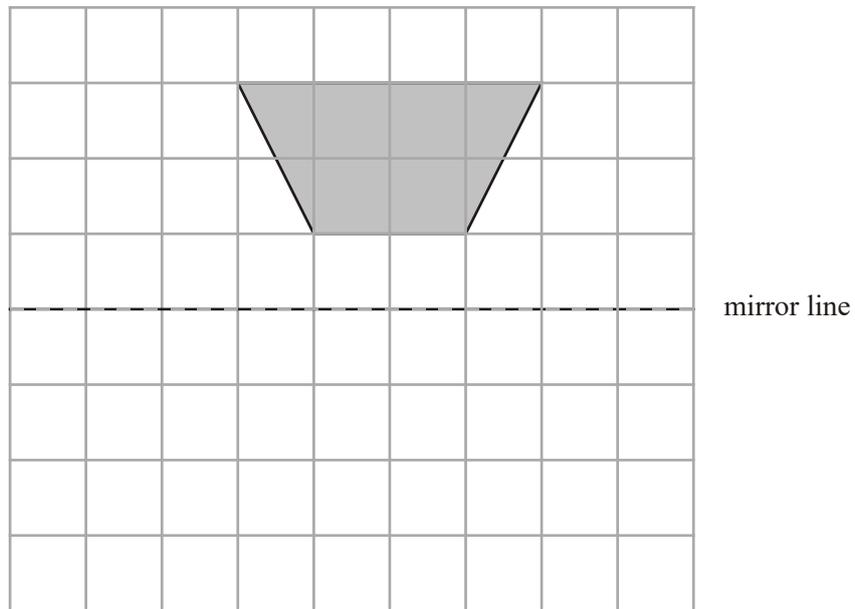
(1)

- (b) Rotate triangle **T** a quarter turn anticlockwise, centre *O*.
Label the new triangle **Q**.

(2)

(Total 3 marks)

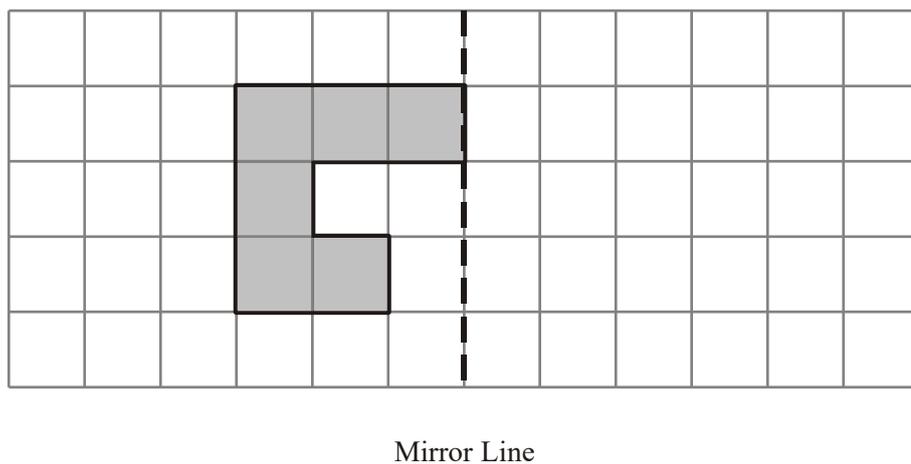
13.



Reflect the shaded shape in the mirror line.

(Total 1 mark)

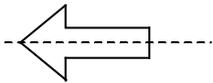
14.



Reflect the shaded shape in the mirror line.

(Total 1 mark)

1.	(a)	14		1	
			<i>B1 cao</i>		
	(b)	6		1	
			<i>B1 cao</i>		
	(c)	Correct reflection		2	
		<i>B2 fully correct</i>			
		<i>(B1 correct reflection in a line parallel to the mirror line or condoning 1 block error in shape or position of shape)</i>			
					[4]
2.	(a)	18, 69		1	
			<i>B1</i>		
	(b)	(i) 18 or 36		1	
			<i>B1</i>		
		(ii) 16 or 36		1	
			<i>B1</i>		
	(c)	factor		1	
			<i>B1</i>		
	(d)	(i) 18		3	
			<i>B1 cao</i>		
		(ii) 11 or 88			
			<i>B1</i>		
		(iii) 69			
			<i>B1 cao</i>		
					[7]
3.	(a)	correct reflection		1	
			<i>B1 cao</i>		
	(b)	correct reflection		1	
			<i>B1 cao</i>		
					[2]

4. (a)  1
Bl for completed shape cao

(b)  1
Bl for line of symmetry drawn

[2]

5. (a) 14 1
Bl cao

(b) 6 1
Bl cao

(c) (Reflection) 1
Bl cao

(d) 12 1
Bl cao

[4]

6. (a) See overlay 1
Bl

(b) See overlay 1
Bl

[2]

7. (a) 14 1
B1 cao
- (b) 6 1
B1 cao
- (c) correct reflection 2
B2 fully correct
(B1 for correct reflection in a line parallel to the given mirror line or condoning 1 block error in shape)
- (d) correct square 1

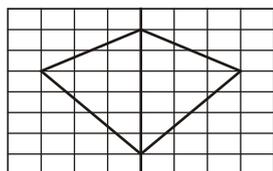
B1
- [5]**
8. (a) Reflection in AB 1
 vertices at (1, 1), (1, 4), (-1, 1)
B1 for correct triangle S
- (b) 180° rotation about O 2
 vertices at (-3, -1), (-5, -1), (-3, -4)
M1 for correct orientation
A1 for correct position T
- [3]**
9. (a) parallelogram 1
B1
- (b) 


2
B2 for correct reflection [coordinates (2, 3), (6, 3), (3, 1), (7, 1)]
(B1 for 3 points correct or correct orientation, incorrect position)
- (c) (8, 4) 1
B1
- [4]**

10. Reflection
 “(1, -1)” “(5, -1)” “(4, -3)”
B1 for correct reflection (all points within 2mm)

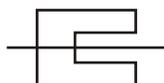
[1]

11. (i) 2



Correct reflection
B1 for a correct kite

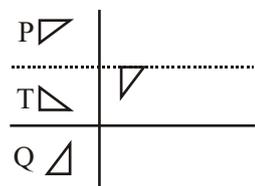
- (ii)



Correct line
B1 for correct line of symmetry

[2]

12. (a)



$(-4, 5), (-1, 7), (-4, 7)$
B1

- (b) $(-1, -1), (-1, -4), (-3, -4)$
B2 fully correct
(B1 correct orientation or 90° clockwise, centre O)

[3]

13. correct reflection
B1 cao

[1]

14. Reflection

1

Bl cao

[1]

1. This question was well understood by all candidates and about 50% of candidates were generally successful and scored full marks. The correct reflection was nearly always seen. The confusion between perimeter and area still exists and answers to part (a) and (b) were often transposed.

2. Specification A

Most candidates achieved some success but few gained full marks. Part (b)(i) (multiple of 9) was well answered but it was not unusual for candidates to then give “multiple” as their answer to part (c). In the final part (symmetry), candidates performed best on part (ii), perhaps helped by the fact that there were two possible answers.

Specification B

Most candidates were able to successfully access at least 4 marks on this question. In part (a) and (b) they were able to write down two numbers from the list with a sum of 87 and write down a number which was a multiple of 9 but found providing a square number a more challenging task. Although candidates clearly understood the term ‘multiple’, they very often went on to state that 11 was a *multiple* of 88.

Many candidates could identify the number with 2 lines of symmetry in (d) they had more trouble recognising that 18 was the required answer to (i) and 69 was the answer to (iii).

3. This question was very well done with around 94% of the candidates scoring both available marks. The half square tolerance allowed the majority of candidates to make their intention clear. However, there were an alarming number of responses where candidate’s lines were not ruled.

4. Only a few candidates failed to reflect the shaded shape correctly in part (a) and most drew the correct line of symmetry in part (b). Occasionally this line was drawn very carelessly and the mark could not be awarded.

5. There were many correct responses but a significant number of candidates confused perimeter with area and vice versa, scoring no marks. Around two thirds of the candidates got part (a) correct and/or part (b) correct.

In part (c) nearly all candidates got this correct with a few adding an extra square to give 4 squares in the top row.

In part (d) just under 60% got the correct volume. By far the most common error was to attempt to find the volume by multiplying a height by a width by a length, reaching 18 ($3 \times 3 \times 2$) or even 8 ($2 \times 2 \times 2$).

6. Paper 8

A large number of candidates labelled a correctly drawn Q as R . Only a tiny minority were able to cope with (b). Most seemed content with reflecting in both the x and y axes and labelling the wrong way round. A large number of candidates who realised that Q should be in the 4th quadrant placed the bottom right hand corner of the triangle on $(-3, 2)$ instead of $(-2, 2)$.

Paper 9

It was usual to see a reflection of P in the y -axis in the correct place, but more often than not it was labelled R , with Q often being shown as a reflection in the x -axis. It may be that the line AB , put there to help candidates in part (b), actually had the unfortunate effect of distracting them in part (a); often a correct Q was crossed out to be replaced by R .

Full marks were only achieved by a small proportion of the candidature.

7. Parts (a) and (b) were often correctly answered. If not it was either a miscount on the perimeter (e.g. 13 cm) or the answers were transposed. Both (c) and (d) were generally correctly drawn with the majority of the candidates scoring all 3 marks for these parts of the question.
8. The majority of candidates attempted this question and nearly 30% of the candidates scored at least one mark. Many reflected the triangle in the y -axis whilst others reflected the triangle in the x -axis rather than in the line AB . Many were able to rotate the triangle by 180° , scoring one mark, but used an incorrect centre of rotation, often using the point $(2, 0)$ instead of the origin. A third transformation was seen on a number of scripts, usually making a triangle appear in all 4 quadrants. Most triangles were labelled correctly.

9. Only 30% of candidates were able to correctly identify the parallelogram in (a). The notion of 'keep it simple' needed to be applied rather than the inventiveness of some of the responses. Names like 'fryperium', 'tolaruus' and 'quadril' are written more in hope than in expectation! In part (b) over half the candidates were able to score one mark by either providing 3 correct vertices or reflecting the parallelogram in another horizontal line, generally the line $y = 5$ with just under half the candidates scoring both marks. The most common incorrect response was to translate the shape downwards. In part (c) two thirds of the candidates provided the correct answer of (8, 4) with most of the incorrect answers being (4, 8).
10. 20% failed to gain the mark for a correct reflection. Errors usually centred around either reflecting the triangle in the y -axis instead of the x -axis or giving several choices of answer.
11. The vast majority of candidates successfully drew the reflection of the shape in (i) with only a few drawing a rectangle instead. Quite a number of the candidates knew what to do in part (ii) but lost the mark by not drawing the line of symmetry long enough. There were also some attempts to draw reflections of the shape either to the right or left and adding their own vertical mirror line to show this.
12. Surprisingly the reflection in the line ' AB ' was not handled well. Many ignored the given line and substituted this by reflecting in the ' y -axis' whilst others used the line ' AB ' but produced a translation rather than the reflection. Others gave multiple reflections that were not rewarded. Only 18% of the candidates gave the correct reflection. There were some better attempts in part (b) which involved a rotation through ' 90° ' anticlockwise about the 'centre O'. Most recognised that the resulting triangle needed to be congruent to the given one with sides of '2' and '3' squares. Where the rotation had been performed correctly (about 43%) it often did not end up in the right location with only 15% scoring both marks in part (b). Many candidates did not label their diagrams. Much improvement in the performance in this question might have been achieved if the candidate had used tracing paper in both parts.
13. A small minority of candidates translated the trapezium vertically, but over 90% of candidates correctly reflected the trapezium in the horizontal mirror line.
14. This was a well answered question with most candidates scoring full marks.