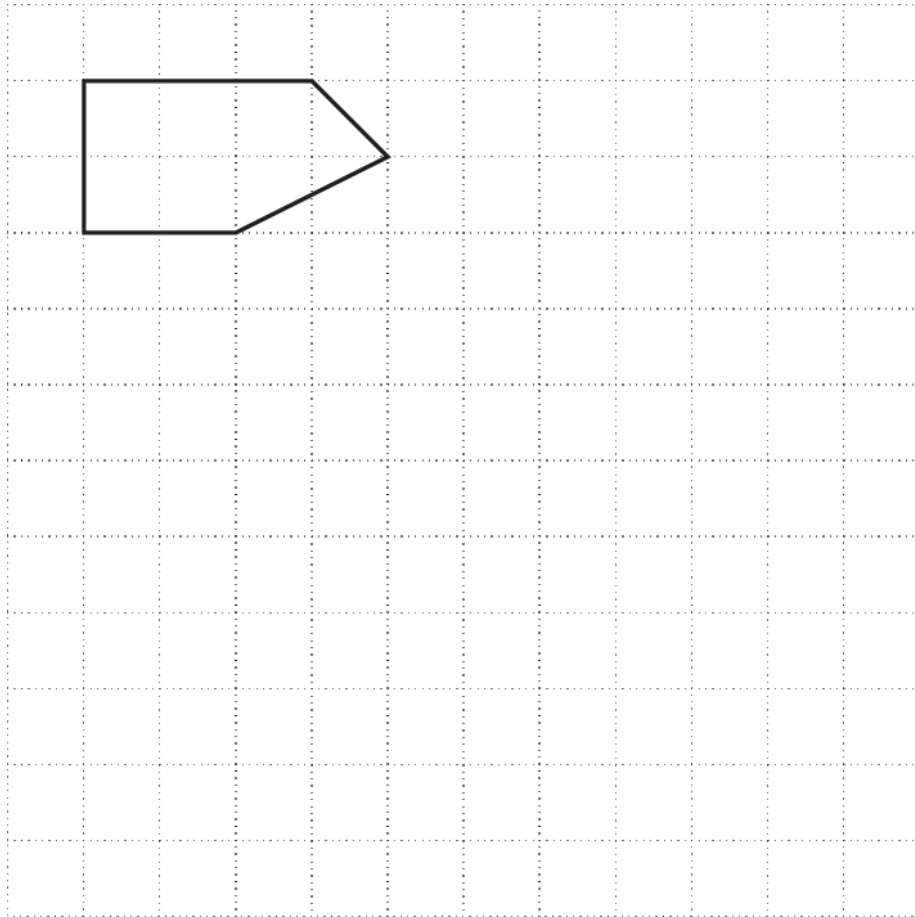


1. Enlarge the shape below with scale factor 2.



2. On the grid, draw an enlargement of triangle P with scale factor 2.



[3]

[2]

3(a). Triangle **B** is an enlargement of triangle **A**.

Select from the following to complete each sentence.

You may use a value more than once.

two	three	four	six
-----	-------	------	-----

Each length of triangle **B** is _____ times the corresponding length of triangle **A**.

The perimeter of triangle **B** is _____ times the perimeter of triangle **A**.

The area of triangle **B** is _____ times the area of triangle **A**.

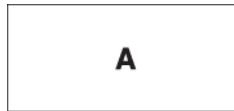
[3]

(b). Name one property of triangle **A** which remains the same after enlargement to triangle **B**.

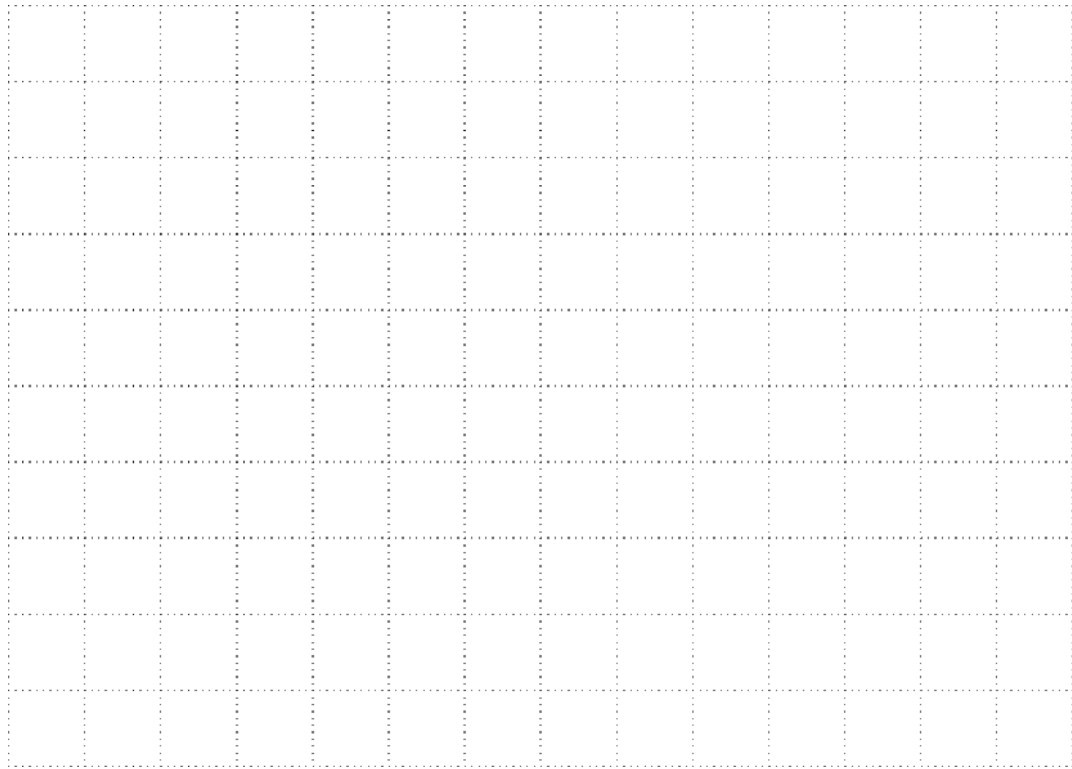
[1]



4(a). Rectangle A is 4 cm long and 2 cm wide.



On the grid, draw a rectangle, B, that is **not** similar to A.
All the sides of the rectangle must lie on grid lines.



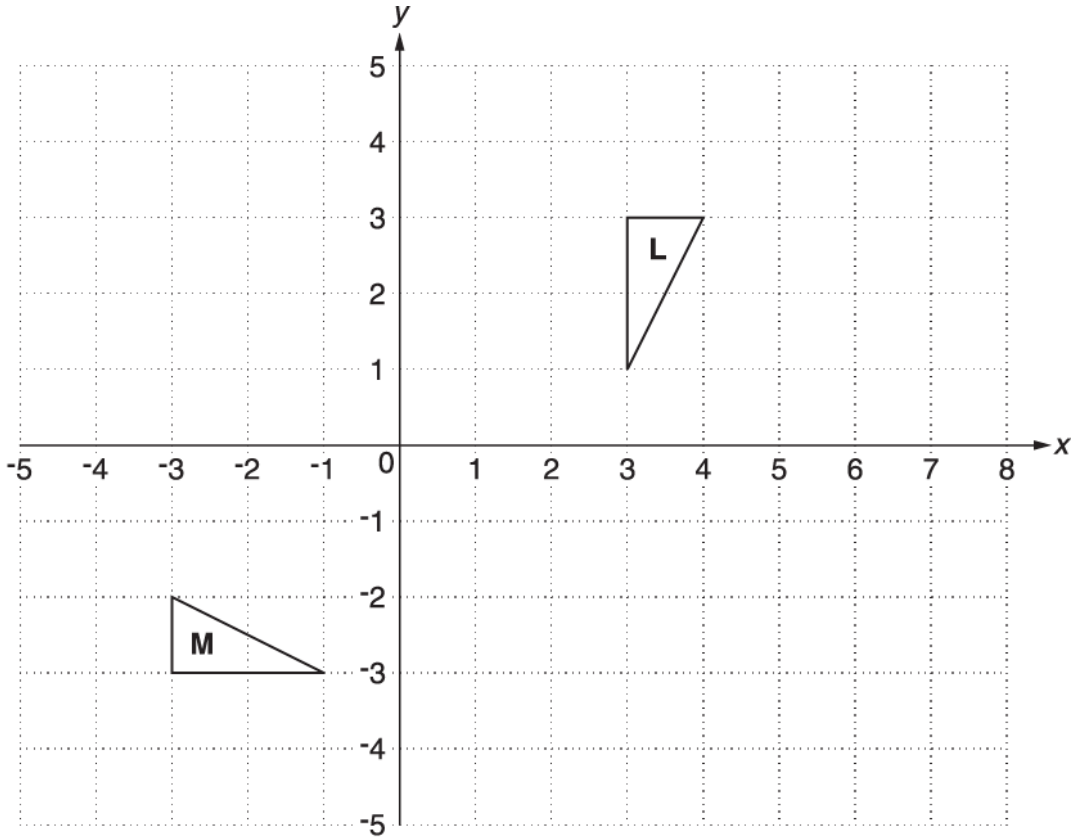
(b). Use values to explain why rectangles A and B are not similar.

[1]

[2]



5(a). Triangles L and M are drawn on the grid below.



Describe fully the **single** transformation that maps triangle L onto triangle M.

 ----- [3]



(b). Translate triangle L using the vector $\begin{pmatrix} 2 \\ -4 \end{pmatrix}$. Label your image T.

[2]

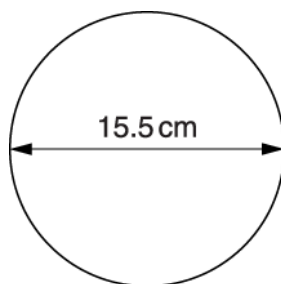


(c). With the transformations in (a) and (b) both the lengths *and* the angles in the image are the same as in the original shape.

Describe what would happen to the lengths and angles in triangle L after an enlargement of scale factor 4.

 ----- [2]

6. A circular tea plate has a diameter of 15.5 cm.



A circular dinner plate is an enlargement of the circular tea plate.
The dinner plate has a diameter of 27.9 cm.

Complete the following sentences.

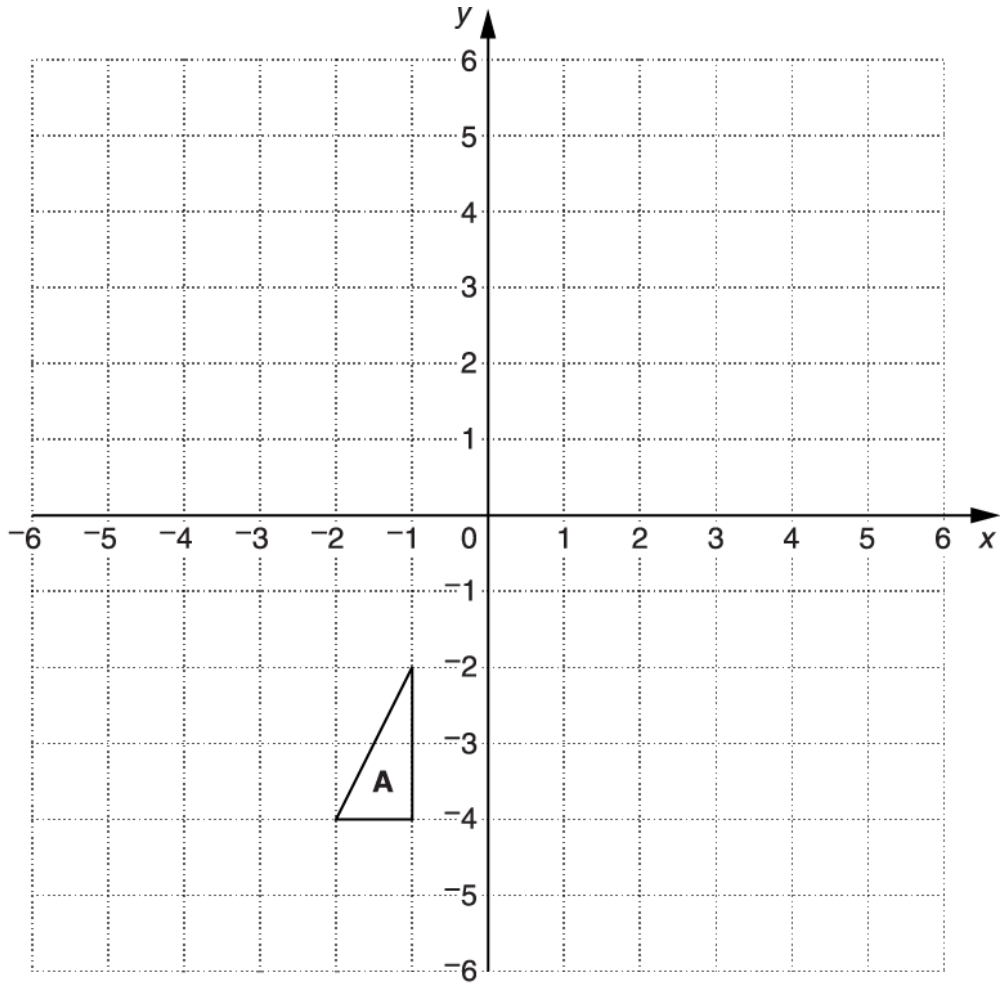
The scale factor of the enlargement is _____ .

The circumference of the dinner plate is _____ times the circumference of the tea plate.

[3]



7. Shape A is drawn on a one-centimetre square grid.



Enlarge shape A with scale factor 2 and centre $(-3, -5)$.

[3]

8. A photograph measures 15 cm by 10 cm.
Mrs Adam orders an enlargement of the photograph with a scale factor of 2.5.

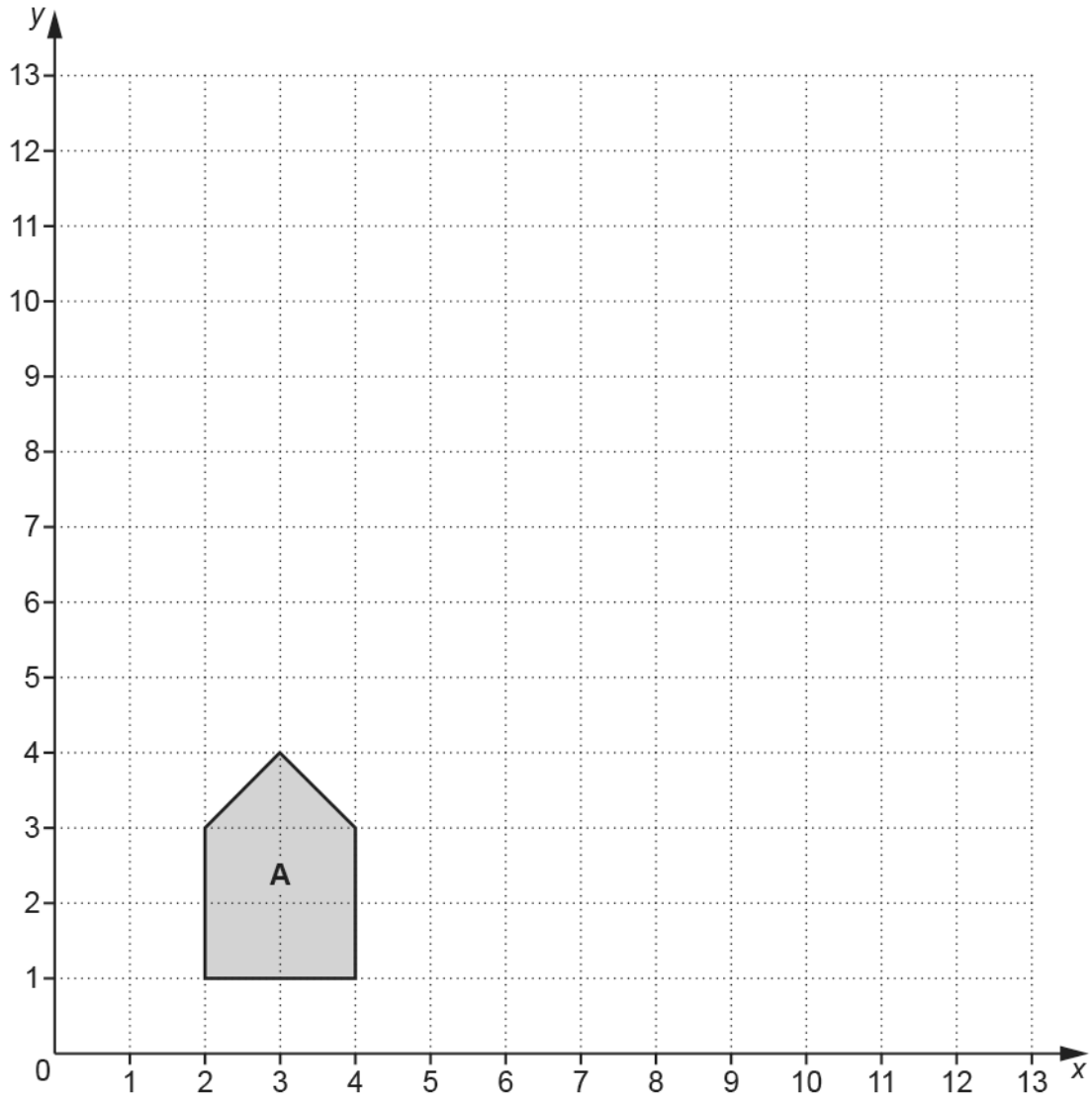
What are the measurements of the enlarged photograph?

9. Describe fully the enlargement that maps triangle A onto triangle B.
----- cm by ----- cm [2]

----- [2]



10. Shape A is drawn on the grid below.

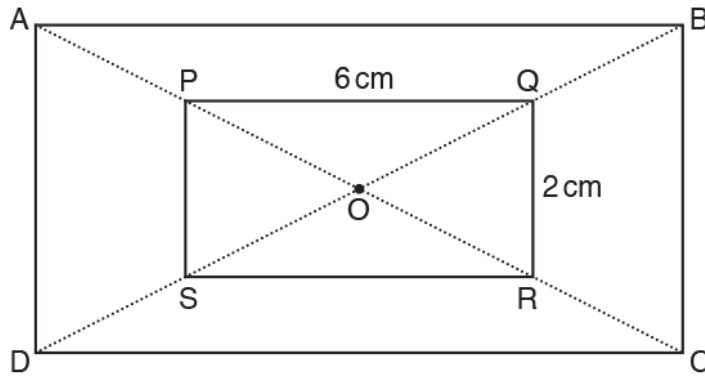


Enlarge shape A with scale factor 3 and centre of enlargement (0, 0).

[3]



11. ABCD and PQRS are rectangles.
O is the centre of both rectangles.



Not to scale

AC is a straight line passing through P, O and R.
BD is a straight line passing through Q, O and S.

PQ = 6 cm and QR = 2 cm.

The perimeter of rectangle ABCD is 40 cm.

Work out the length and width of rectangle ABCD.

length = ----- cm

width = ----- cm [3]

END OF QUESTION PAPER

Question			Answer/Indicative content	Marks	Part marks and guidance	
1			Correct enlargement	3	M2 for 3 correct sides M1 for 2 correct sides	<p>Condone good freehand/intention</p> <p>Examiner's Comments</p> <p>A well answered question and the majority scored 3 marks for a completely correct enlargement. Marks were usually lost as a result of drawing the horizontal and/or the vertical lines at an incorrect length. This resulted in the diagonal lines (particularly the lower one) being wrong. Scale factor and orientation were rarely misunderstood.</p>
			Total	3		
2			Correct enlargement	2	<p>B1 for correct enlargement and incorrect scale factor or two points correct or correct size but incorrect orientation</p> <p>Examiner's Comments</p> <p>Many correct enlargements were seen. A few candidates used the wrong scale factor and a few isosceles triangles were seen. Most responses were drawn reasonably accurately but a minority lost marks through careless drawing.</p>	<p>Use overlay vertices within circles</p> <p>Triangle must be appropriate with correct orientation</p> <p>Lines ruled or very good freehand</p>
			Total	2		

Question			Answer/Indicative content	Marks	Part marks and guidance	
3	a		2 2 4	3	B1 for each	<p><u>Examiner's Comments</u></p> <p>This was generally answered well. For less able candidates there appeared to be some guesswork with random numbers chosen from those given but the majority gave a scale factor of 2 for the length and the perimeter and then a different factor for the area although this was not always given as 4.</p>
	b		Size of angles	1	Accept both have a right angle	<p>Condone 'angles' Not 'same shape'</p> <p><u>Examiner's Comments</u></p> <p>This was very well answered with almost all candidates recognising the angles remained the same after enlargement.</p>
			Total	4		

Question		Answer/Indicative content	Marks	Part marks and guidance	
4	a	Rectangle that is not $4n$ by $2n$	1	<p>Examiner's Comments</p> <p>Part (a) was quite well done and many had a ruler and pencil. Some went to great pains to draw another similar rectangle and lost the mark. Some drew a rotation of the rectangle or of an enlarged version. Very few candidates drew a different shape entirely such as a parallelogram or triangle.</p>	Length is not double width
	b	<p><i>Their width</i> \div <i>their length</i> $\frac{2}{4}$ correct and $\neq \frac{2}{4}$ oe Or $4 \times a = \textit{their length}$ and $2 \times b = \textit{their width}$</p>	2	<p>M1 for one correct scale factor or ratio between length and width</p> <p>$b \neq a$</p> <p>If 0 SC1 for Correct reference to “too long” or “too thin” oe or different scale [factor]</p> <p>Examiner's Comments</p> <p>In part (b) very few scored a mark. Most simply said, “They are not similar because the first was 4cm by 2cm and mine is...”. Others described rotations, area or perimeter. Almost none mentioned scale factors or ratios between sides.</p>	<p>Fractions must be shown to be different by equivalence or reduction (correctly) to decimals Accept length is not double width oe for 2 marks</p> <p>Must compare both e.g. “It is too long for the width”</p>
		Total	3		

Question		Answer/Indicative content	Marks	Part marks and guidance	
5	a	Rotation 90° anticlockwise [Centre] (3, -3)	3	Allow 1 each line 0 if > one transformation given	Or rotate, rotates, rotated. Condone 'turn' Or 270° clockwise Allow 'about', 'point', origin etc
	b	Image at (5, -1), (6, -1), (5, -3)	2	Allow 1 if translated $\begin{pmatrix} 2 \\ p \end{pmatrix}$ or $\begin{pmatrix} q \\ -4 \end{pmatrix}$	Use overlay Condone freehand. Mark intention.
	c	Lengths × 4 Angles unchanged oe	1 1	Do not accept "The shape" or "measurements" for "lengths" Examiner's Comments This was the first common question with Higher Tier and many found it hard. The common error in part (a) was to describe a combination of transformations which scored no marks. Candidates need to appreciate the reason why single is emboldened in the question. Those who did answer with a single transformation often gave a partial description such as rotation, or turn, sometimes with 90°, but did not mention anticlockwise or the centre (3, -3). Part (c) revealed that many candidates thought that angles were enlarged under enlargement. Some gave poor descriptions such as "It will get bigger". A full description including "lengths multiplied by 4" or the equivalent was rarely seen.	Condone "Lengths increase by 4" but not "Lengths increase by 4cm" Ignore comments about congruence or similarity etc Exemplar Response The size of L would increase by 4 × its original size (0) The lengths and angles will become 4 × bigger of triangle L. Also it will the image is not the same as the original shape (1 0) They would all increase and become 4 times larger (1 0) It will be 4 times bigger of triangle L from point (0, 0) (0) The angles will be the same after enlargement but the lengths will be different (0 1) Angles will stay the same, lengths would be divided by 4 (0 1) The angles would remain the same. The lengths would increase by 4 (1 1) The lengths would increase however the angles would stay the same (0 1) The sides would all multiply in size by 4 so it would be 8

Question			Answer/Indicative content	Marks	Part marks and guidance
					<p>high and wide (1 0)</p> <p>They would all increase by 4 times the size (1 0)</p> <p>The angles would be the same because the triangles would be congruent but the sides would be 4 times larger (1 1)</p> <p>It will be 4 times as large as its original size (0)</p> <p>The lengths would double but the angles stay the same. (0 1)</p> <p>The angles would stay the same but the lengths would be increased by 4. You would have to multiply the existing lengths by 4 to obtain the new lengths. (1 1)</p>
			Total	7	

Question		Answer/Indicative content	Marks	Part marks and guidance	
6		1.8 or $\frac{9}{5}$ or $1\frac{4}{5}$ $1.8[0\dots]$ or $\frac{9}{5}$ or $1\frac{4}{5}$	2 1FT	M1 for $27.9 \div 15.5$ or $(87.65$ to $87.7) \div (48.69$ to $48.71)$ FT <i>their</i> scale factor Examiner's Comments Candidates found this part hard as they were not always sure what they were supposed to write on the answer line. Some rounded the value to 2 for the scale factor, presumably thinking it had to be an integer and they did not show a more accurate value. Some appreciated that the two values should be the same if they had made an error with the first part. Many started again with the circumference and so scored the final mark but not the mark for the scale factor.	
		Total	3		

Question		Answer/Indicative content	Marks	Part marks and guidance	
7		Correct enlargement $(-1,-3)$ $(1,-3)$ $(1,1)$	3	<p>B2 correct centre incorrect sf or 2 correct vertices</p> <p>B1 correct sf incorrect centre</p> <p>Examiner's Comments</p> <p>Many candidates gained one mark for drawing a correct enlargement in the correct orientation, often with one vertex at $(-3, 5)$. Few candidates were able to give a correct response. Candidates who understood the need to use a centre for the enlargement frequently made other errors such as incorrect scale factor or simple did not "project" each point consistently. Most understood the orientation of the shape does not change as a result of enlargement.</p>	<p>must be an enlargement in the correct orientation tolerance of 2mm</p> <p>triangle of sf 2 in correct orientation. A translation of the correct triangle tolerance of 2mm</p>
		Total	3		
8		37.5 by 25	2	<p>M1 for \times by 2.5 or</p> <p>B1 for 37.5 or 25 as answer</p> <p>Examiner's Comments</p> <p>Many candidates were able to give the correct answer. A frequent error was to add 2.5 to each measurement, rather than to multiply by it.</p>	
		Total	2		

Question			Answer/Indicative content	Marks	Part marks and guidance	
9			$(-4, 8)$ 3	2	<p>B1 for one correct Max 1 mark if second transformation mentioned</p> <p>Examiner's Comments</p> <p>About half the candidates were able to give the scale factor of the enlargement correctly. Candidates need to try and give a response of scale factor 3 rather than three times as big etc, but they were not penalised if they did this. Only a few attempted to give a centre of enlargement.</p>	<p>Condone missing brackets in coordinates, Do not allow a vector Condone 3 times (bigger) or $\times 3$ etc Condone sf + 3 Condone 1 : 3 but not 3 : 1</p>
			Total	2		

Question		Answer/Indicative content	Marks	Part marks and guidance	
10		Correct enlargement (6, 3) (12, 3) (12, 9) (9, 12) (6, 9)	3	<p>B2 for correct enlargement incorrect centre or enlargement scale factor 2 from correct centre OR M1 for 3 points correctly plotted</p> <p><u>Examiner's Comments</u></p> <p>The majority of candidates did not appear to be familiar with the term centre of enlargement. Many scored 2 marks for using a correct scale factor. Candidates should ensure they use a ruler</p>	<p>Condone good freehand</p>
		Total	3		

Question		Answer/Indicative content	Marks	Part marks and guidance		
11		[length =] 15 [width =] 5	3	<p>M1 for perimeter PQRS = 16 or $2 \times \textit{their}$ length + 2 $\times \textit{their}$ width = 40</p> <p>M1 for ratio length AB to BC oe = 3:1 soi $\frac{40}{\textit{their}16}$ S</p> <p>oi</p>	<p>Condone length = 5 width = 15 If answer line is blank accept 15 and 5 correctly placed on the diagram</p>	
				Examiner's Comments		
				<p>Not many gave the correct answers, and 15 and 5 were often in reversed places when seen. A good number of candidates worked out 16 as the perimeter of the inner rectangle, but then didn't appreciate that the rectangles were similar. Others worked from the knowledge that the outer rectangle had a perimeter of 40 and therefore they chose 2 sides which added to 20. Some realised that the outer rectangle was an enlargement of the inner one and gave answers in a ratio of 1 : 3. In these cases the scale factor used was usually 2.</p>		
		Total	3			