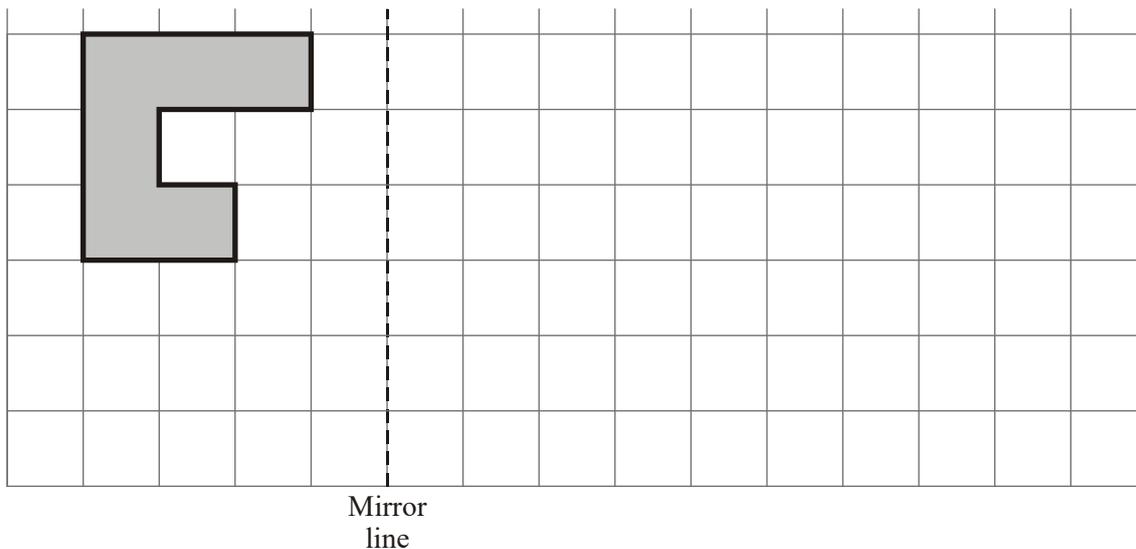


1. A shaded shape is shown on the grid of centimetre squares.



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

.....cm (1)

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

.....cm<sup>2</sup> (1)

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

(2)  
(Total 4 marks)

2.

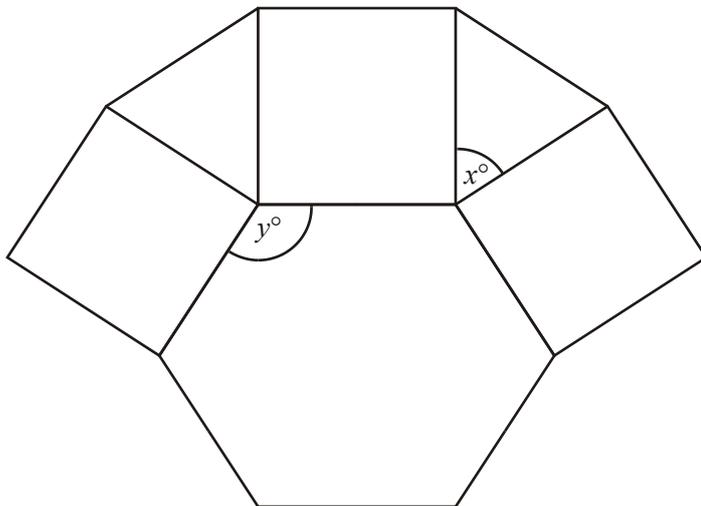


Diagram **NOT**  
accurately drawn

This is part of the design of a pattern found at the theatre of Diana at Alexandria.

It is made up of a regular hexagon, squares and equilateral triangles.

- (a) Write down the size of the angle marked  $x^\circ$ .

.....<sup>o</sup>

(1)

- (b) Work out the size of the angle marked  $y^\circ$ .

.....<sup>o</sup>

(2)

The area of each equilateral triangle is  $2 \text{ cm}^2$ .

- (c) Work out the area of the regular hexagon.

..... $\text{cm}^2$

(2)

- (d) In the space below, use ruler and compasses to **construct** an equilateral triangle with sides of length 4 centimetres.  
You must show all construction lines.

(2)

(Total 7 marks)

3. The diagram shows a rectangular carpet.

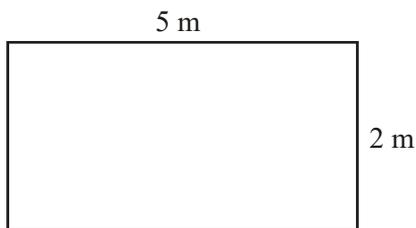
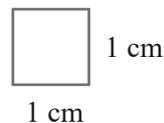
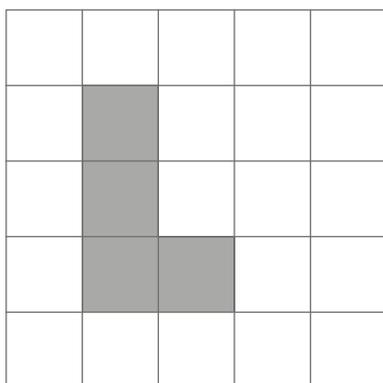


Diagram **NOT** accurately drawn

Work out the area of the carpet.

.....  
(Total 2 marks)

- 4.



- (a) (i) Find the area of the shaded shape.

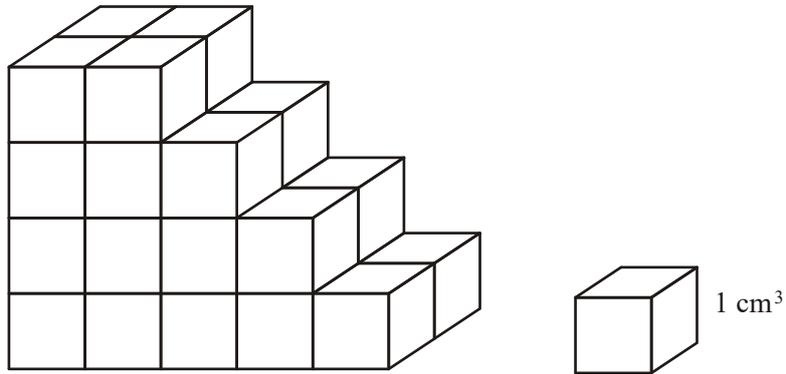
..... cm<sup>2</sup>

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

..... cm

(2)

Here is a solid prism made from centimetre cubes.



(b) Find the volume of the solid prism.

.....  $\text{cm}^3$

(2)

(Total 4 marks)

5. The diagram shows a Tangram.

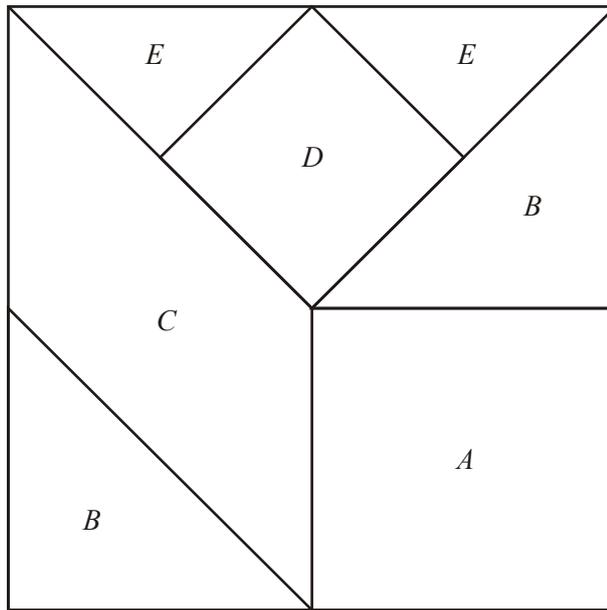


Diagram accurately drawn

The Tangram is a large square that is made up from

one square *A*,  
 two triangles *B*,  
 one parallelogram *C*,  
 another square *D* and  
 two small triangles *E*.

The total area of the Tangram is  $64 \text{ cm}^2$ .

Find the area of

- (i) square *A*,

.....  $\text{cm}^2$

- (ii) triangle *B*,

.....  $\text{cm}^2$

- (iii) parallelogram *C*.

.....  $\text{cm}^2$   
 (Total 4 marks)

6.

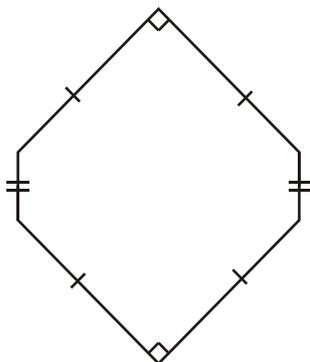


Diagram **NOT** accurately drawn

The diagram shows a shape.

The shape is a 6-sided polygon.

(a) Write down the mathematical name for a 6-sided polygon.

.....

(1)

The diagram below shows how the shape tessellates.

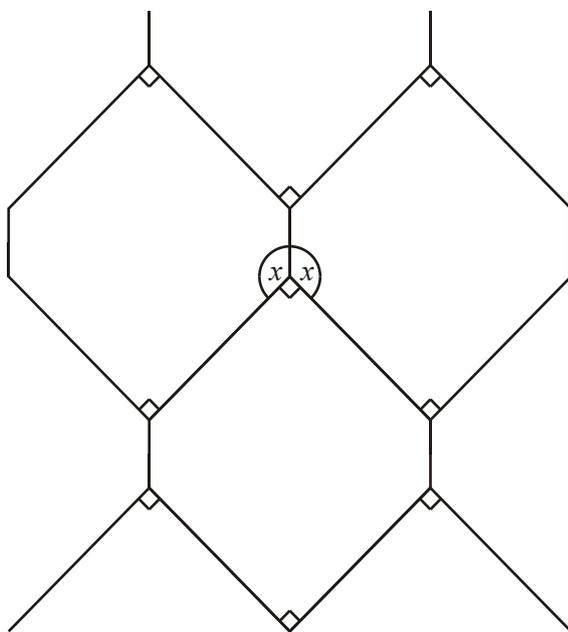


Diagram **NOT** accurately drawn

The size of each of the angles marked  $x$  is  $135^\circ$ .

(b) Give reasons why.

.....

.....

.....

(2)

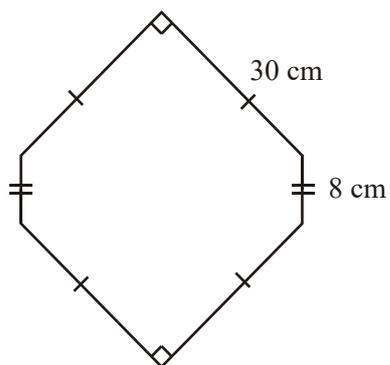


Diagram **NOT** accurately drawn

The diagram shows the lengths of two of the sides of the shape.

(c) Work out the perimeter of the shape.

.....cm

(2)

(Total 5 marks)

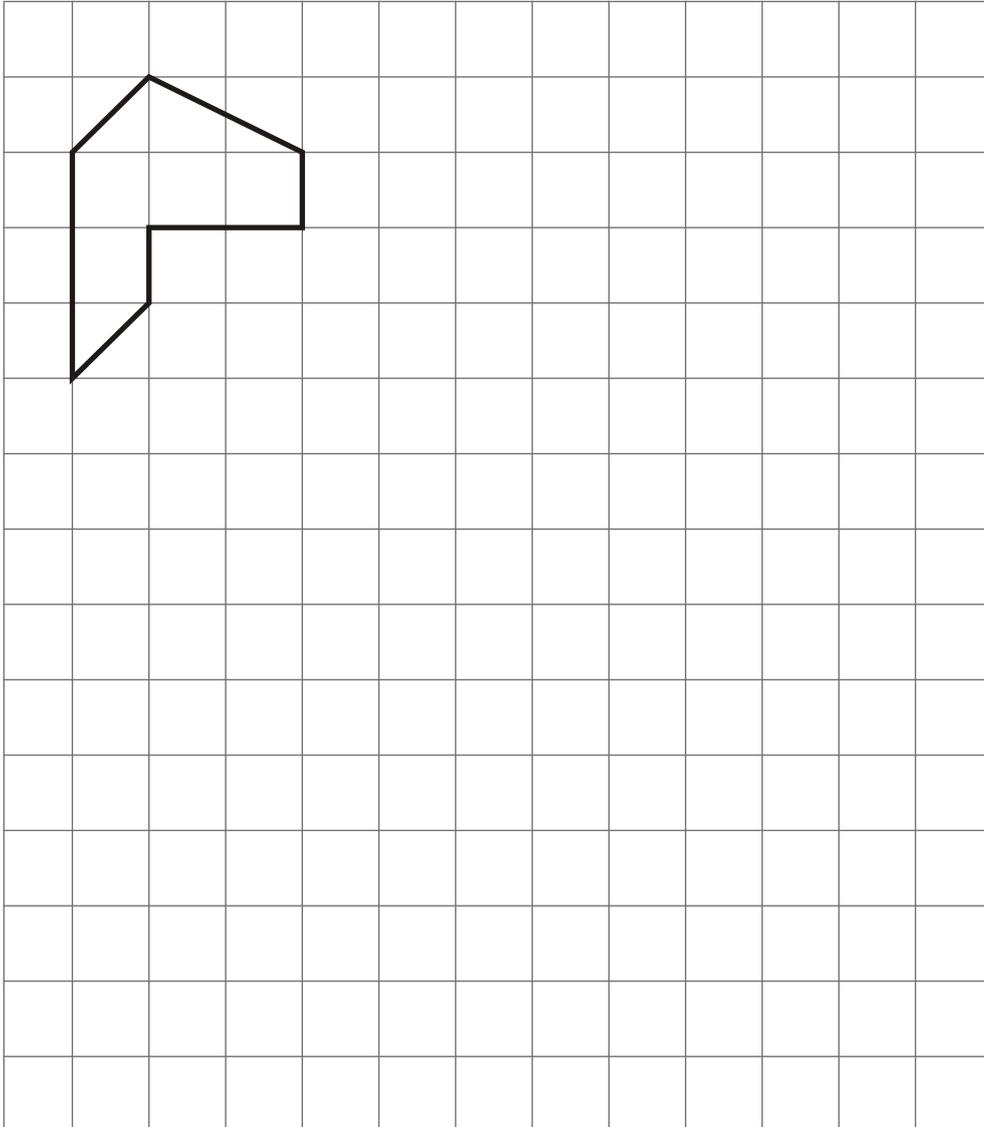
7. A shape has been drawn on a grid of centimetre squares.

- (a) Work out the area of the shape.  
State the units with your answer.

.....

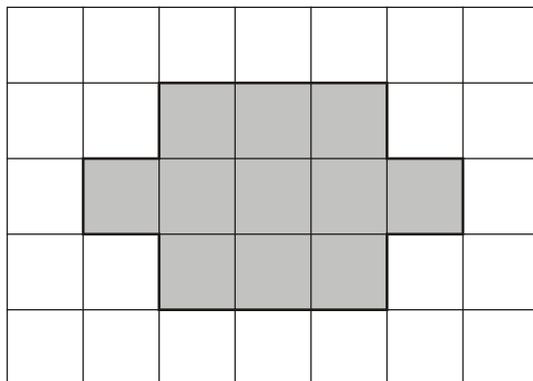
(3)

(b) On the grid, enlarge the shape with a scale factor of 2.



(2)  
(Total 5 marks)

8. A shaded shape has been drawn on the centimetre grid.



- (a) (i) Find the area of the shaded shape.

.....cm<sup>2</sup>

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

.....cm

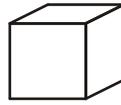
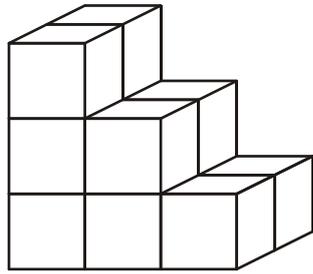
(2)

The shaded shape has **two** lines of symmetry.

- (b) Draw the **two** lines of symmetry on the shaded shape.

(2)

(c) Find the volume of this prism.



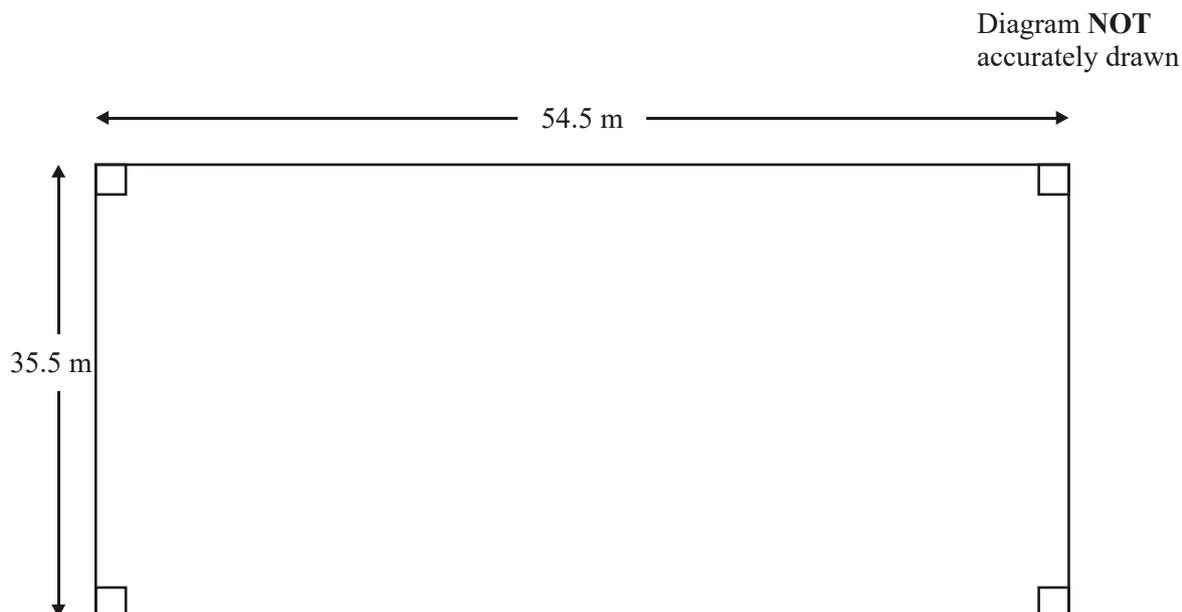
represents 1 cm<sup>3</sup>

Diagram **NOT** accurately drawn

.....cm<sup>3</sup>

**(2)**  
**(Total 6 marks)**

9. The diagram shows a rectangular field.



The length of the field is 54.5 m.

The width of the field is 35.5 m.

The field is for sale.

Mrs Fox wants to buy the field.

She also wants to plant a hedge along the perimeter.

The field costs £11.44 per square metre.

Each metre length of hedge costs £4.81

£ .....

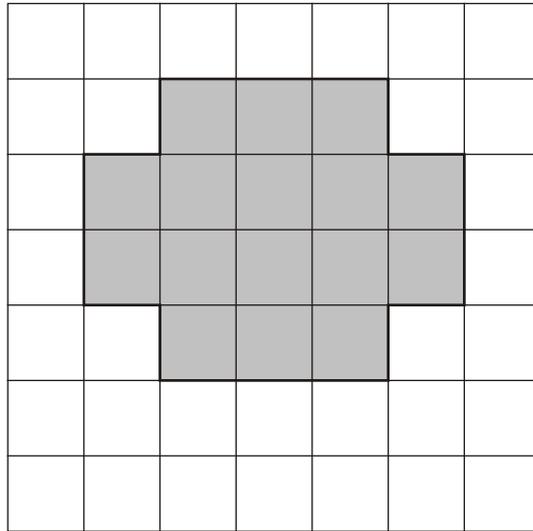
Mrs Fox has £23 000

Has Mrs Fox enough money to buy the field and plant the hedge?

You must show the working you use to make your decision.

(Total 6 marks)

10.



The diagram shows a shaded shape drawn on a centimetre grid.

- (a) Find the area of the shaded shape.  
State the units of your answer.

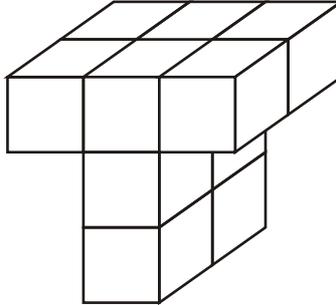
.....

(2)

(b) Find the perimeter of the shaded shape.

.....cm

(1)



The diagram shows a prism made of centimetre cubes.

- (c) Find the volume of the prism.

.....cm<sup>3</sup>

(2)

(Total 5 marks)

11.

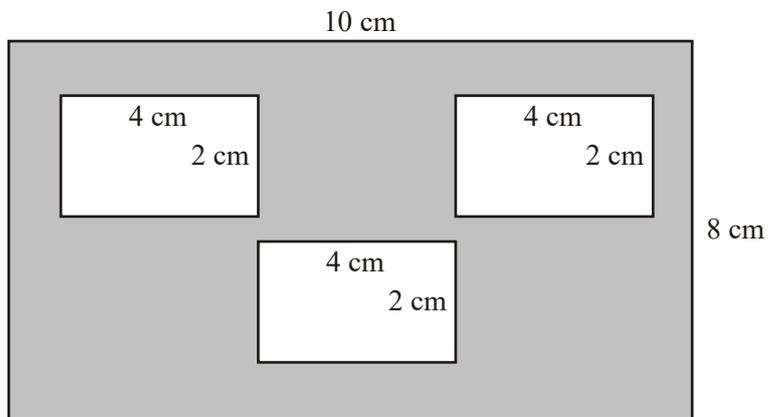


Diagram **NOT** accurately drawn

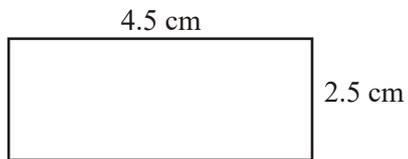
The diagram shows 3 small rectangles inside a large rectangle.  
The large rectangle is 10 cm by 8 cm.  
Each of the 3 small rectangles is 4 cm by 2 cm.

Work out the area of the region shown shaded in the diagram.

.....cm<sup>2</sup>  
(Total 3 marks)

12. (a) Work out the area of this rectangle.

Diagram **NOT** accurately drawn



.....cm<sup>2</sup> (2)

A square has an area of 324 cm<sup>2</sup>.

- (b) Work out the length of one side of the square.

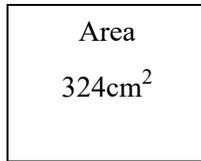


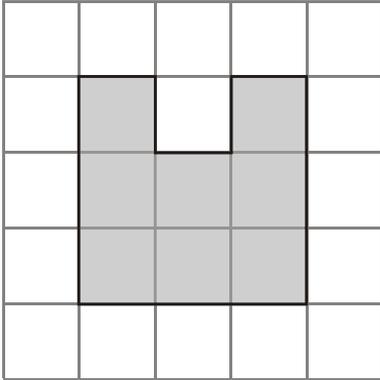
Diagram **NOT** accurately drawn

.....cm

(2)

(Total 4 marks)

13. Here is a shaded shape on a centimetre grid.



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

..... cm<sup>2</sup>

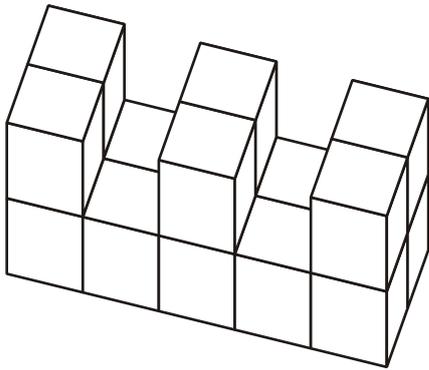
(1)

(b) Find the perimeter of the shaded shape.

..... cm

(2)

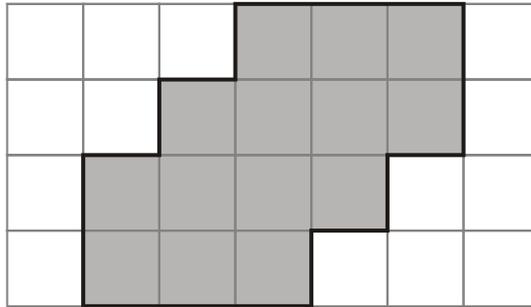
Here is a solid prism made of centimetre cubes.



(c) Find the volume of the solid prism.

..... cm<sup>3</sup>  
(2)  
(Total 5 marks)

14. This 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.

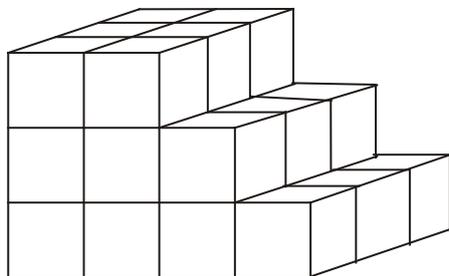
..... cm<sup>2</sup>

**(1)**

This solid prism is made from centimetre cubes.

(c) Find the volume of the prism.

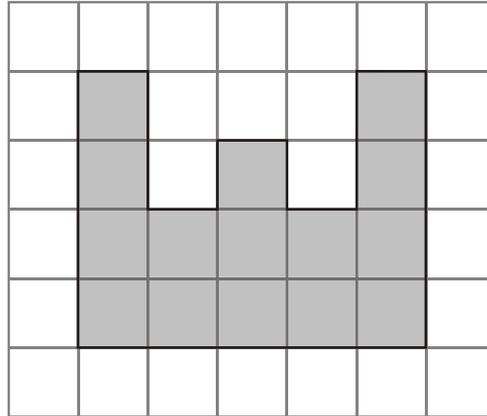
Diagram **NOT**  
accurately drawn



..... cm<sup>3</sup>

(2)  
(Total 4 marks)

15. A shaded shape has been drawn on the centimetre grid.



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

..... cm

(1)

(b) Find the area of the shaded shape.

..... cm<sup>2</sup> (1)

Here is a solid prism made from centimetre cubes.

- (c) Find the volume of this prism.

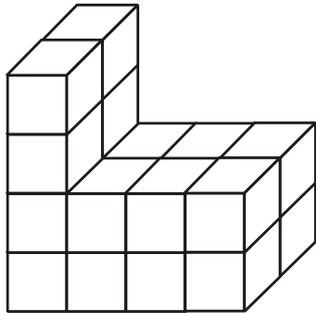
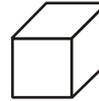


Diagram **NOT** accurately drawn



represents 1 cm<sup>3</sup>

..... cm<sup>3</sup>

(2)  
(Total 4 marks)

16. Here is a rectangle.

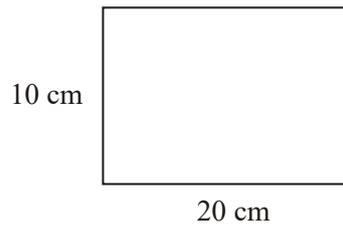


Diagram **NOT** accurately drawn

- (a) Work out the perimeter of the rectangle.

..... cm

(2)

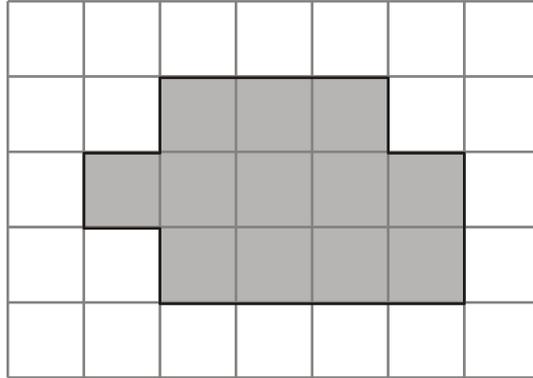
(b) Work out the area of the rectangle.

..... cm<sup>2</sup>

(2)

(Total 4 marks)

17.



The diagram shows a shaded shape drawn on a centimetre grid.

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

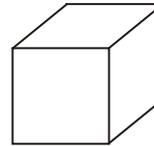
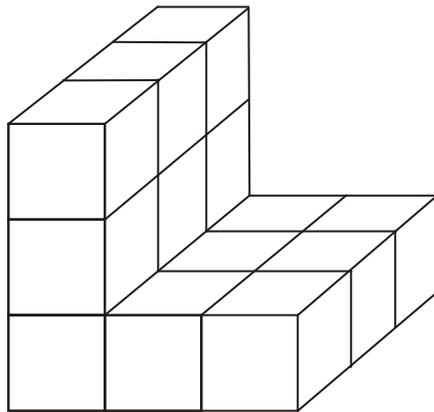
..... cm

**(1)**

- (b) Work out the area of the shaded shape.  
State the units of your answer.

.....

(2)



represents  
 $1 \text{ cm}^3$

Diagrams **NOT** accurately drawn

Here is a solid prism made of centimetre cubes.

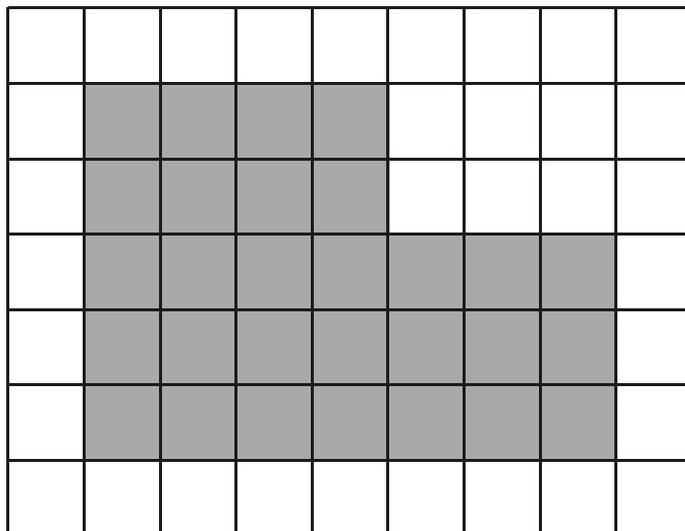
(c) Find the volume of the solid prism.

.....  $\text{cm}^3$

(2)

(Total 5 marks)

18.



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

(a) Find the area of the shaded shape.

.....

(2)

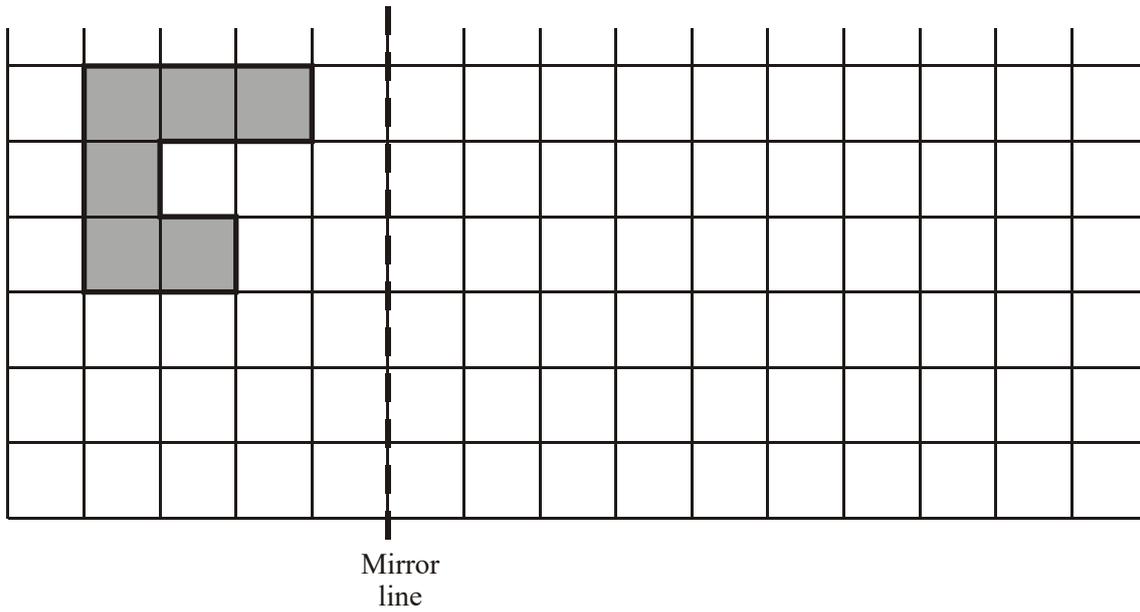
(b) Find the perimeter of the shaded shape.

.....cm

(1)

(Total 3 marks)

19. 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.

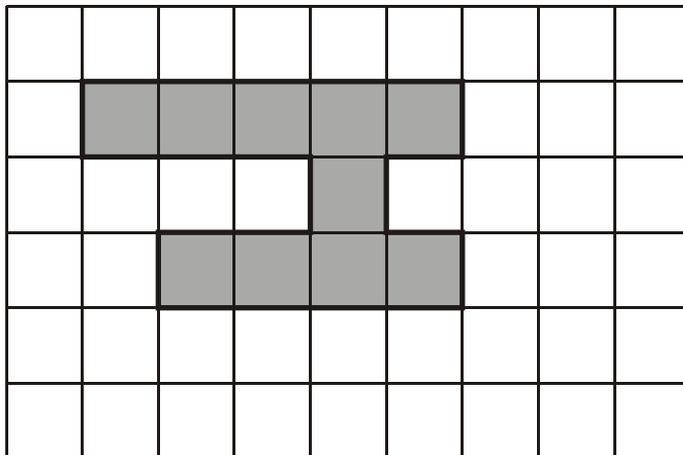
..... cm<sup>2</sup> (1)

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

(2)

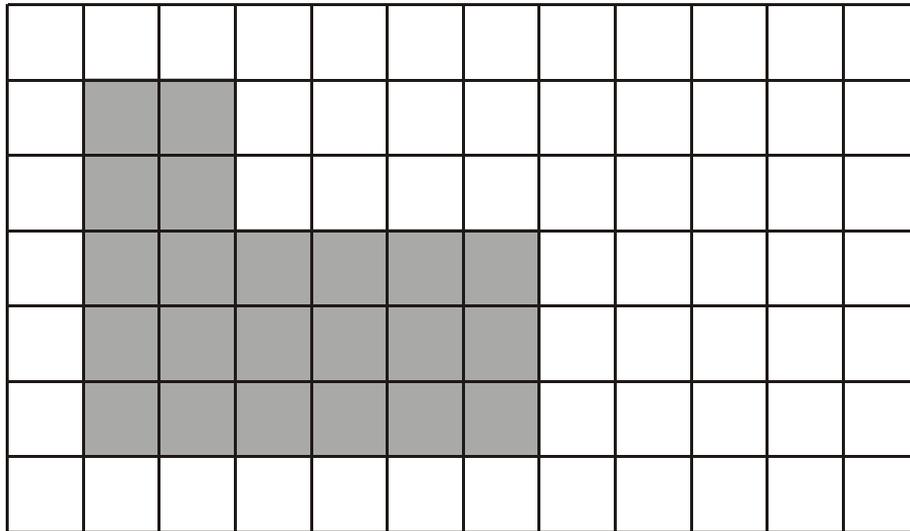
On the grid below, 10 squares are shaded.

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



(1)  
(Total 5 marks)

20.



A shaded shape has been drawn on the centimetre grid.

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

.....

(2)

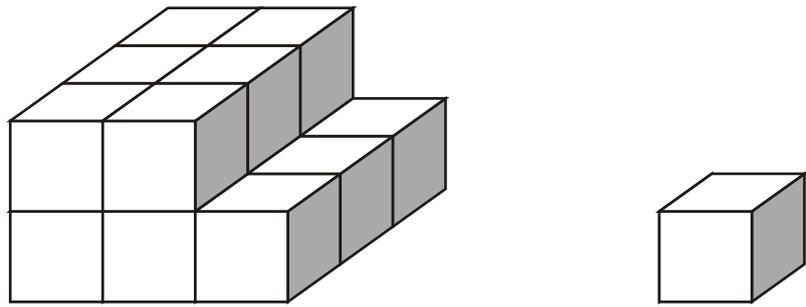


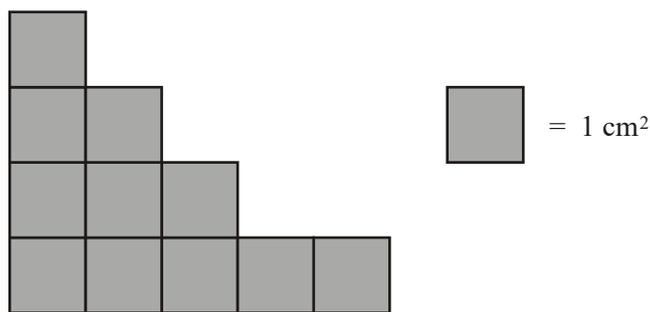
Diagram **NOT** accurately drawn

This solid shape is made from cubes of side one centimetre.

(b) Work out the volume of the solid shape.

..... cm<sup>3</sup>  
 (2)  
 (Total 4 marks)

21.



(a) Find the area of the shape.

..... cm<sup>2</sup>  
 (1)

(b) Find the perimeter of the shape.

.....

(2)  
(Total 3 marks)

22. Here are two trapeziums.

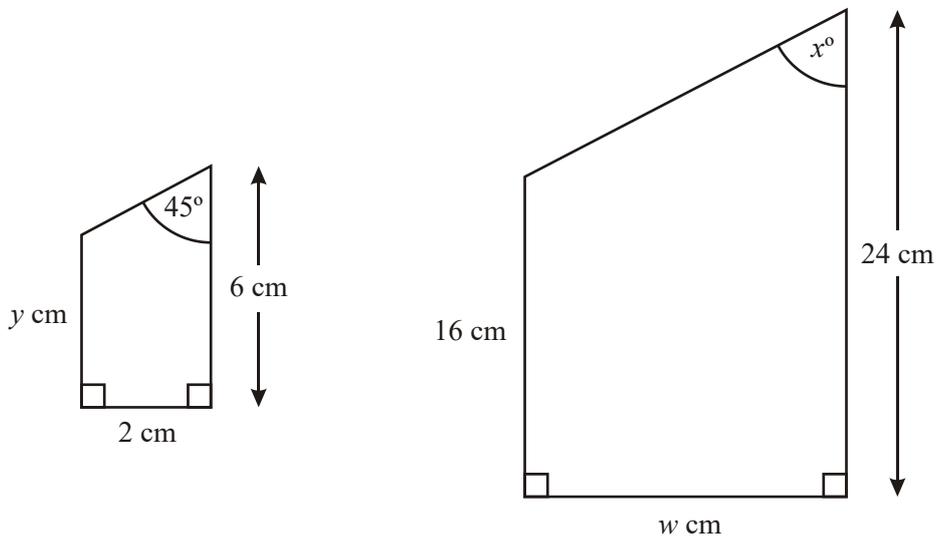


Diagram NOT accurately drawn

The big trapezium is an enlargement of the small trapezium with a scale factor of 4.

(a) Find the value of

(i)  $w$ ,

$w = \dots\dots\dots$

(ii)  $x$ ,

$x = \dots\dots\dots$

(iii)  $y$ .

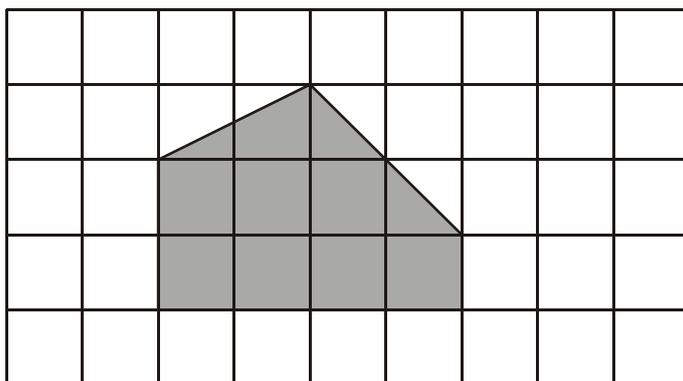
$y = \dots\dots\dots$

(3)

(b) Work out the area of the big trapezium.

..... cm<sup>2</sup>  
 (2)  
 (Total 5 marks)

23. A shaded polygon has been drawn on the centimetre grid.



(a) Work out the area of the shaded polygon.

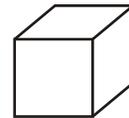
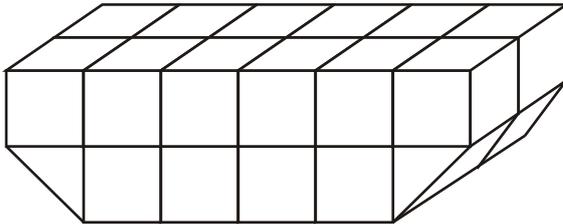
..... cm<sup>2</sup>  
 (2)

(b) Write down the mathematical name of the shaded polygon.

.....

(1)  
(Total 3 marks)

24.



represents 1 cm<sup>3</sup>

Diagrams **NOT** accurately drawn

In this solid prism, the volume of each small cube is 1 cm<sup>3</sup>.

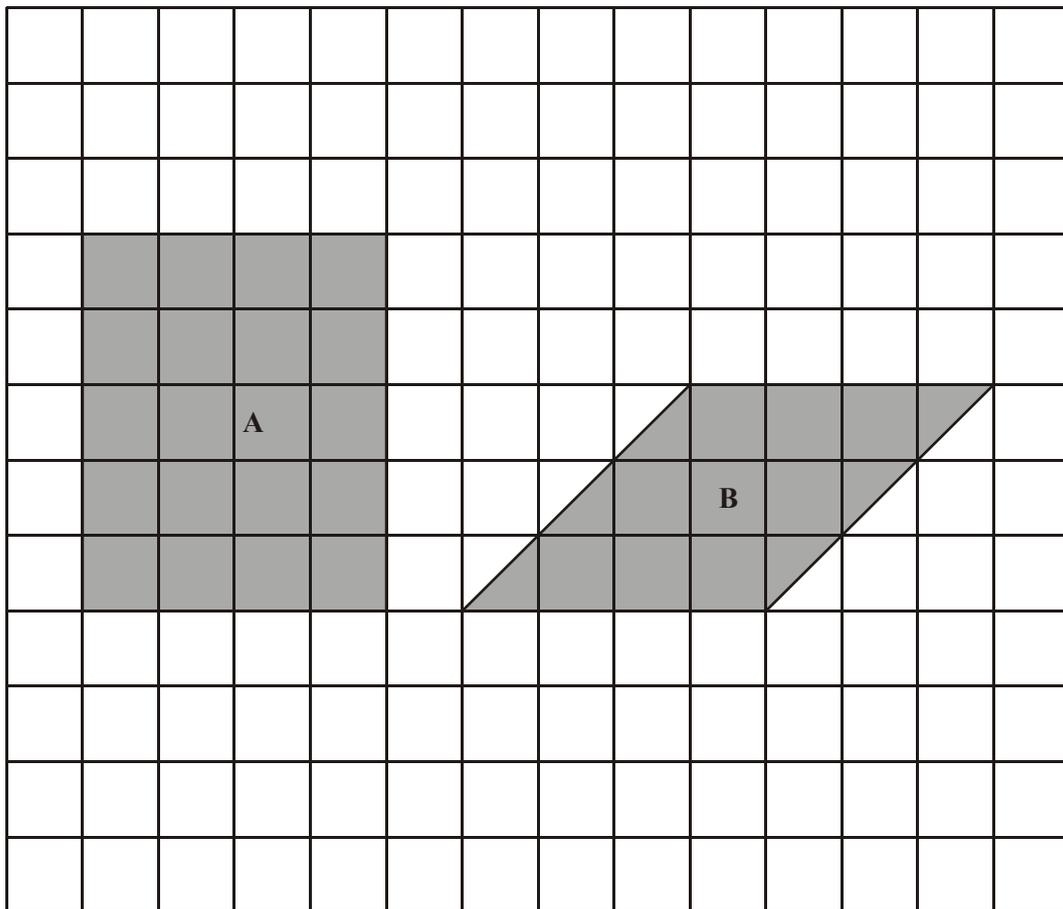
(i) Find the area of the top face of the prism.

..... cm<sup>2</sup>

(ii) Work out the volume of the prism.

..... cm<sup>3</sup>  
(Total 3 marks)

25.



Two shaded shapes are shown on the grid of centimetre squares.

(a) Find the perimeter of shape **A**.

.....

(2)

(b) Work out the area of shape **B**.

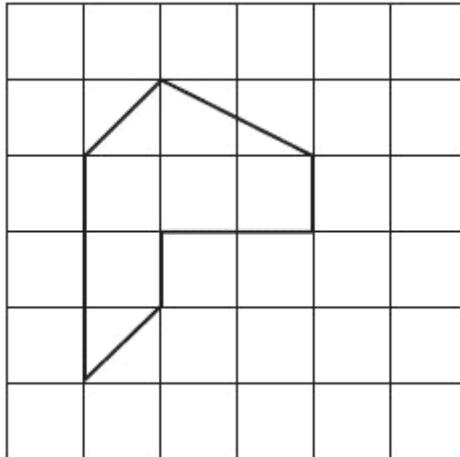
..... cm<sup>2</sup>

(2)

(Total 4 marks)

26. A shape has been drawn on a grid of centimetre squares.

Work out the area of the shape.  
State the units with your answer.

.....  
(Total 3 marks)

27. Here is a rectangle.

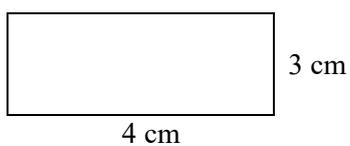


Diagram **NOT**  
accurately drawn

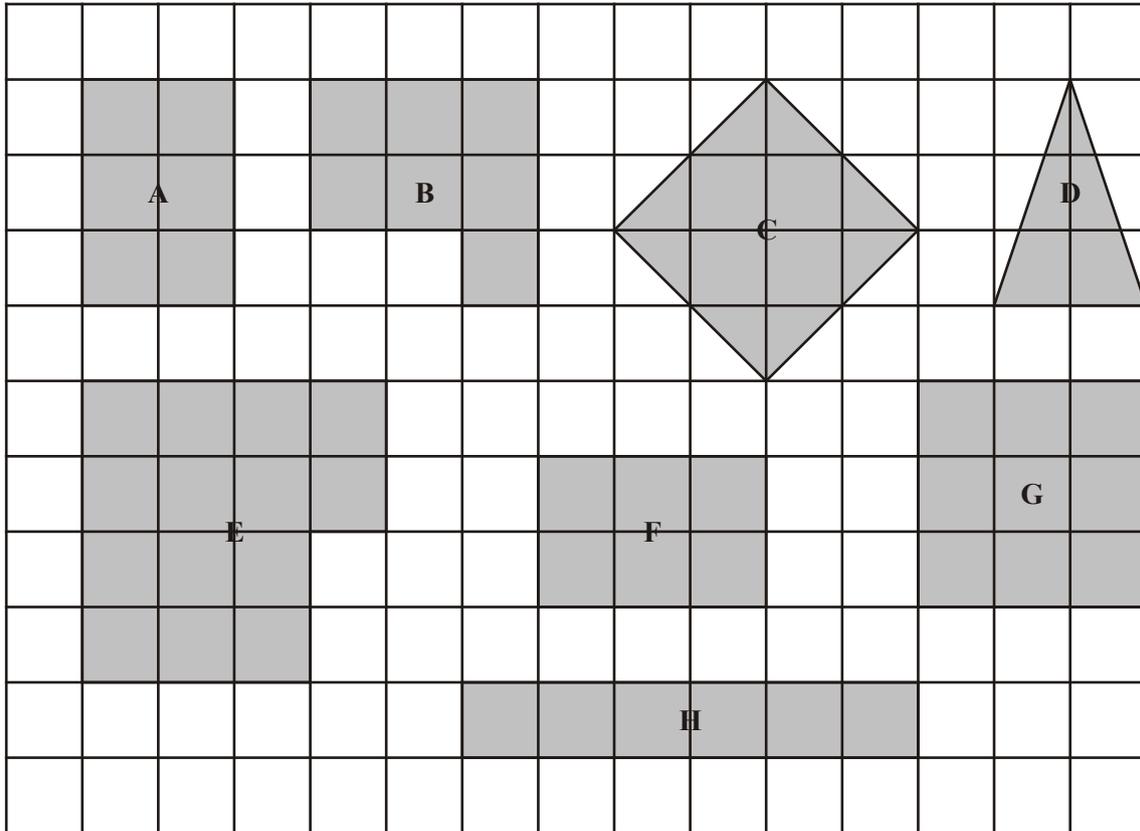
(a) Work out the area of the rectangle.

..... cm<sup>2</sup> (2)

(b) Work out the perimeter of the rectangle.

..... cm (1)  
(Total 3 marks)

28. Here are 8 shapes on a grid of centimetre squares.



(a) Find the area of shape *C*.

..... cm<sup>2</sup> (2)

(b) Write down the special name for triangle *D*.

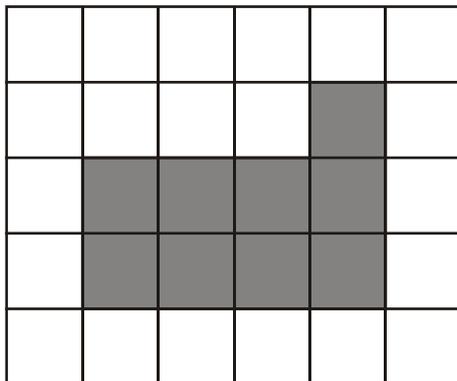
..... (1)

Two of the shapes are congruent.

(c) Write down the letters of these two shapes.

..... and ..... (1)  
**(Total 4 marks)**

29. A shaded shape has been drawn on a grid of centimetre squares.

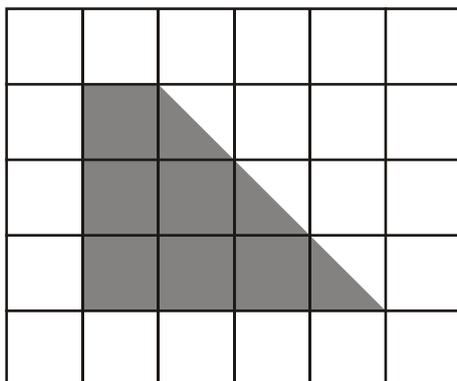


(a) Find the perimeter of the shaded shape.

.....cm

(1)

Another shaded shape has been drawn on a grid of centimetre squares.



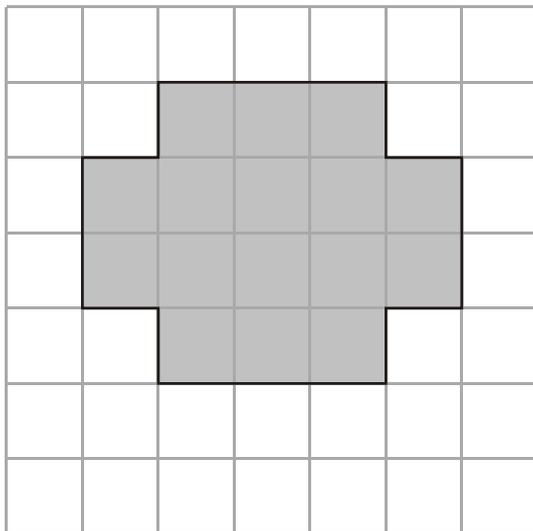
(b) Find the area of the shaded shape.

..... cm<sup>2</sup>

(2)

(Total 3 marks)

30.



The diagram shows a shaded shape drawn on a centimetre grid.

Find the area of the shaded shape.  
State the units of your answer.

.....  
(Total 2 marks)

31. Work out the area of this rectangle.

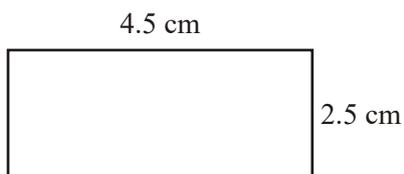


Diagram **NOT** accurately drawn

.....cm<sup>2</sup>  
(Total 2 marks)

32. Simplify

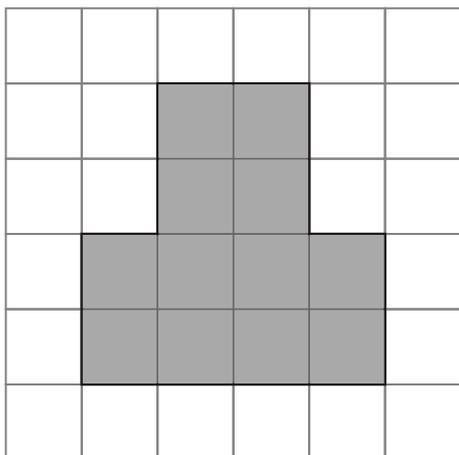
(a)  $e + f + e + f + e$

..... (1)

(b)  $2xy + 3xy - xy$

..... (1)  
**(Total 2 marks)**

33. This shaded shape is drawn on a centimetre grid.



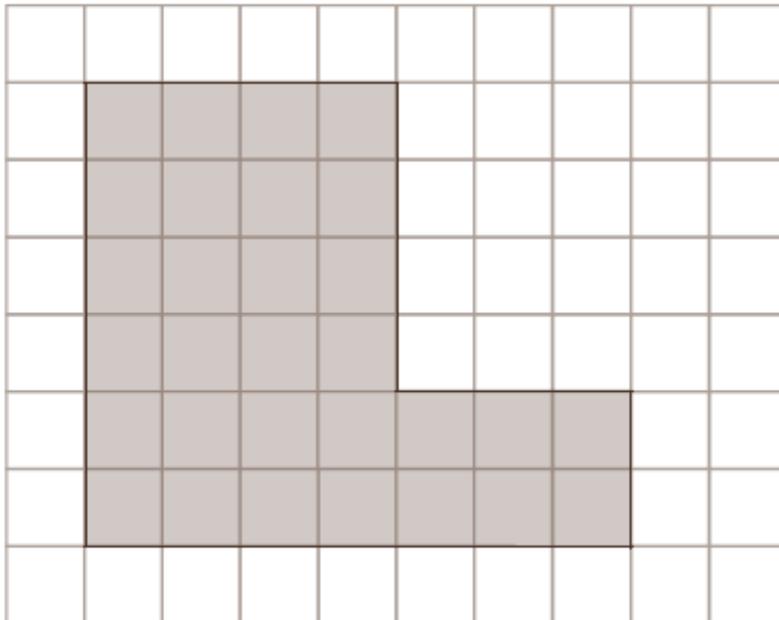
(a) Work out the perimeter of the shaded shape.

..... cm (1)

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

..... cm<sup>2</sup>  
 (1)  
 (Total 2 marks)

34.



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

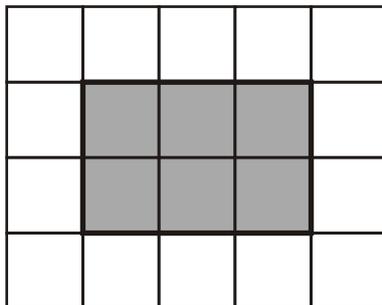
- (a) Find the perimeter of the shaded shape.

.....cm  
 (1)

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

.....cm<sup>2</sup>  
 (1)  
 (Total 2 marks)

35. Look at the shaded rectangle on the centimetre grid below.



What is the area of the shaded rectangle?

$3 \text{ cm}^3$   
      
**A**

$5 \text{ cm}^2$   
      
**B**

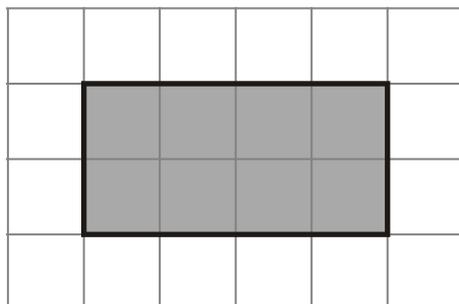
$6 \text{ cm}^2$   
      
**C**

$10 \text{ cm}^2$   
      
**D**

$12 \text{ cm}^2$   
      
**E**

(Total 1 mark)

36. Here is a shaded rectangle on a centimetre grid.



What is the area of the shaded rectangle?

$24 \text{ cm}^2$   
**A**

$14 \text{ cm}^2$   
**B**

$12 \text{ cm}^2$   
**C**

$8 \text{ cm}^2$   
**D**

$6 \text{ cm}^2$   
**E**

(Total 1 mark)

37. Here is a rectangle.

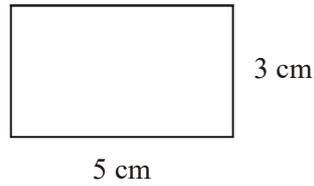


Diagram **NOT** accurately drawn

The area of the rectangle is

$7\frac{1}{2}\text{ cm}^2$

$4\text{ cm}^2$

$16\text{ cm}^2$

$15\text{ cm}^2$

$8\text{ cm}^2$

**A**

**B**

**C**

**D**

**E**

(Total 1 mark)

38.

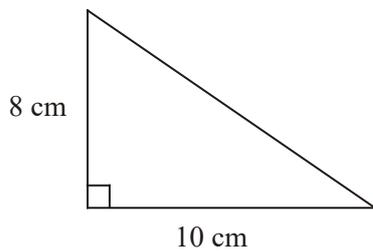


Diagram **NOT** accurately drawn

The area of this triangle is

$9\text{ cm}^2$

$20\text{ cm}^2$

$40\text{ cm}^2$

$18\text{ cm}^2$

$80\text{ cm}^2$

**A**

**B**

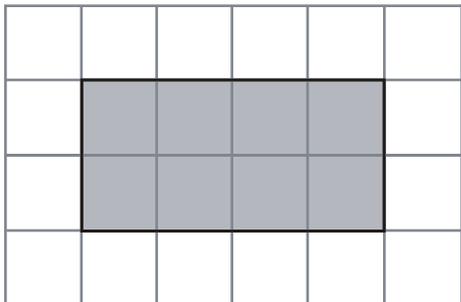
**C**

**D**

**E**

(Total 1 mark)

39. A shaded shape is drawn on a centimetre grid.



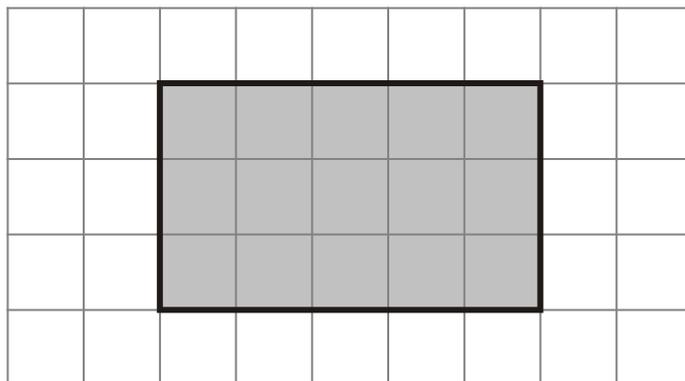
(a) Find the perimeter of the shaded shape.

..... cm (1)

(b) Find the area of the shaded shape.

..... cm<sup>2</sup> (1)  
(Total 2 marks)

40. Here is a shaded shape on a grid of centimetre squares.



(a) Find the perimeter of the shaded shape.

..... cm (1)

(b) Find the area of the shaded shape.

..... cm<sup>2</sup>

(1)

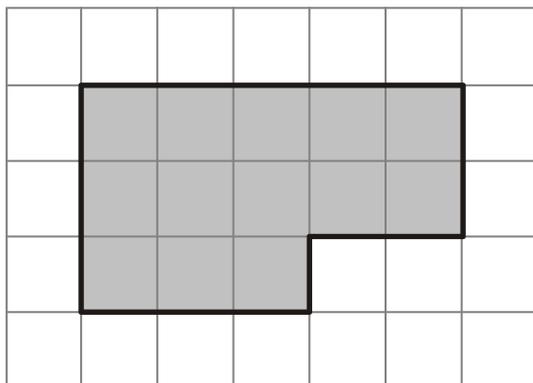
(c) Write down the mathematical name of the shaded shape.

.....

(1)

(Total 3 marks)

41. Here is a shaded shape on a grid of centimetre squares.



What is the area of the shaded shape?

12 cm<sup>2</sup>

13 cm<sup>2</sup>

14 cm<sup>2</sup>

15 cm<sup>2</sup>

16 cm<sup>2</sup>

**A**

**B**

**C**

**D**

**E**

(Total 1 mark)

42. What is the area of this shaded shape?

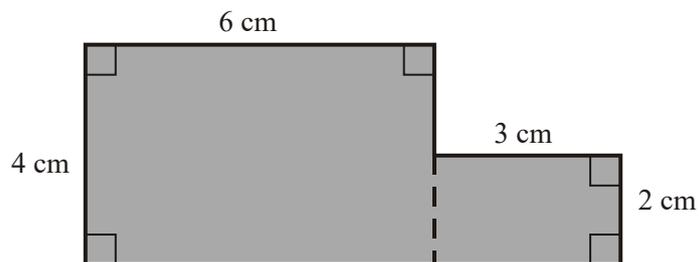


Diagram NOT accurately drawn

30 cm<sup>2</sup>

26 cm<sup>2</sup>

144 cm<sup>2</sup>

24 cm<sup>2</sup>

15 cm<sup>2</sup>

**A**

**B**

**C**

**D**

**E**

(Total 1 mark)

43. Here is a rectangle.

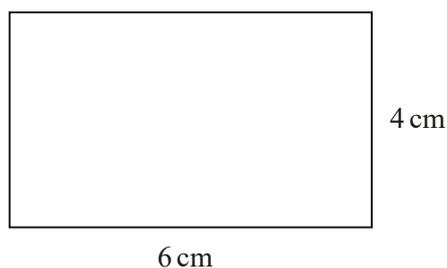


Diagram NOT accurately drawn

What is the area of the rectangle?

10 cm<sup>2</sup>

20 cm<sup>2</sup>

24 cm<sup>2</sup>

12 cm<sup>2</sup>

52 cm<sup>2</sup>

**A**

**B**

**C**

**D**

**E**

(Total 1 mark)

1. (a) 14

*Blao*

1

(b) 6

*Blao*

1

	(c)	Correct reflection <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>	2	
				<b>[4]</b>
2.	(a)	60 <i>B1 cao</i>	1	
	(b)	120 $360 - 60 - 90 - 90$ <i>M1 for <math>360 - "60" - 90 - 90</math> or <math>180 - "60"</math></i> <i>A1 cao</i>	2	
	(c)	12 $6 \times 2$ <i>M1 for <math>6 \times 2</math></i> <i>A1 cao 12</i>	2	
	(d)	Correct drawing <i>B2 for triangle and construction lines</i> <i>(B1 for 1 line of length 4cm and correct arcs crossing</i> <i>OR for correct triangle with either no arcs or incorrect arcs)</i> <i>SC: B1 similar triangle drawn with construction lines</i>	2	
				<b>[7]</b>
3.		10 $m^2$ <i>B1 for 10</i> <i>B1 indep for <math>m^2</math>.</i>	2	
				<b>[2]</b>

4. (a) (i) 4 1  
*B1 cao*
- (ii) 10 1  
*B1 cao*
- (b) 28 2  
*B2 for 28*  
*(B1 for 29 or  $14 \times 2$ )*
- [4]**
5. (i)  $16 \text{ cm}^2$  4  
*B1 cao*
- (ii)  $8 \text{ cm}^2$   
*M1 for  $\frac{4 \times 4}{2}$  or "16" - 2*
- (iii)  $16 \text{ cm}^2$   
*A1 ft for 8 or "(i)" - 2*  
*B1 ft for 16 or "(i)" or "(ii)"  $\times 2$*
- [4]**
6. (a) hexagon 1  
*B1 Condone spelling error*
- (b) Sum of angles at a point is  $360^\circ$  2  
*B1 for 360 seen*  
*B1 for "point", "complete turn" or "a circle" or similar unless accompanied by an incorrect angle*  
*SC If neither B1 scored, award B1 for a clear indication that the size of an angle, other than x, is  $90^\circ$  or a right angle (may be on diagram)*
- (c) 136 2  
 $30 \times 4 + 8 \times 2$   
*M1  $30 \times 4 + 8 \times 2$  or attempt to sum 5 or 6 lengths*  
*A1 cao*
- [5]**

7. (a)  $6 \text{ cm}^2$  3  
*B2 for 6 cao for numerical answer*  
*(B1 for  $5.5 < \text{Area} \leq 7$ )*  
*then B1 (indep) for  $\text{cm}^2$  with or without numerical answer*

(b) Correct shape 2  
 See diagram  
*B2 (B1 for any 2 sides correct or a correct enlargement scale factor  $\neq 1$  or 2)*

**[5]**

8. (a) (i) 11 2  
*B1 cao*  
 (ii) 16  
*B1 cao*

(b) Correct lines 2  
 See diagram  
*B2 cao for both lines correct*  
*(B1 for one line correct)*

(c) 12 2  
*B2 cao*  
*(B1 for 11 or 13)*

**[6]**

9. Area of field =  $54.5 \times 35.5$  (=1934.75)  
 Cost of field = "1934.75"  $\times$  11.44  
 Perimeter =  $2(54.5+35.5)$  (=180)  
 Cost of hedge = "180"  $\times$  4.81 (=865.80)  
 Total cost = £22 999.34  
 So Mrs Fox can buy field & hedge  
 Mrs Fox can buy field & hedge 6
- MI for either  $54.5 \times 35.5$  or 1934.75*  
*MI for "1934.75"  $\times$  11.44 or 22133.54 seen*  
*MI for  $2(54.5+35.5)$  or better*  
*MI for either "180"  $\times$  4.81 or 865.8 seen*  
*A1 for 22133.54 and 865.8*  
*B1 ft for making a correct comparison between their total and £23 000*
- [6]
10. (a)  $16 \text{ cm}^2$  2
- B1 for 16*  
*B1 (indep) for  $\text{cm}^2$*
- (b) 18 1
- B1 cao*
- (c) 10 2
- B2 for 10*  
*(B1 for 9 or 11 or  $5 \times 2$  or evidence of length  $\times$  width height eg  $2 \times 3 \times 1, 2 \times 3 \times 2$ )*
- [5]
11.  $10 \times 8 = 80$   
 $4 \times 2 = 8$   
 $80 - 3 \times 8$   
 56 3
- MI for  $10 \times 8$  or 80*  
*MI for  $4 \times 2$  or 8 or  $8 \times 3$  or 24;*  
*(NB 8 not the rectangle width)*  
*A1 cao*
- [3]

12.	$4.5 \times 2.5$			
	11.25		2	
		<i>M1 for <math>4.5 \times 2.5</math> or of digits 1125</i>		
		<i>A1 for 11.25</i>		
	$\sqrt{324}$			
	18		2	
		<i>M1 for <math>\sqrt{324}</math></i>		
		<i>A1 for 18</i>		
				<b>[4]</b>
13.	(a) 8		1	
		<i>B1 cao</i>		
	(b) 14		2	
		<i>B2 for 14 (B1 for 13 or 15)</i>		
	(c) 16		2	
		<i>B2 for 16 (B1 for 15, 17 or 8)</i>		
				<b>[5]</b>
14.	(a) 18		1	
		<i>B1 cao</i>		
	(b) 14		1	
		<i>B1 cao</i>		
	(c) 27		2	
		<i>B2 for 27</i>		
		<i>(B1 for 26, 28, or 17 or 9)</i>		
				<b>[4]</b>
15.	(a) 24		1	
		<i>B1 cao</i>		
	(b) 15		1	
		<i>B1 cao</i>		
	(c) 20		2	
		<i>B2 cao</i>		
		<i>(B1 for 10 or 16 or 15)</i>		
				<b>[4]</b>

16. (a)  $10 + 20 + 10 + 20$   
60  
*MI for  $10 + 20 + 10 + 20$*   
*AI cao* 2
- (b)  $10 \times 20$   
200  
*MI for  $10 \times 20$*   
*AI cao* 2
- [4]**
17. (a) 16  
*B1 cao* 1
- (b)  $12 \text{ cm}^2$   
*B1 for 12 cao, B1 (indep) for  $\text{cm}^2$*  2
- (c) 15  
*MI for  $5 \times 3$*   
*AI cao [SC: B1 for 10, 13 or 14]* 2
- [5]**
18. (a)  $29 \text{ cm}^2$   
*B1 for 29*  
*B1 (indep) for  $\text{cm}^2$*  2
- (b) 24  
*B1* 1
- [3]**

19. (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]**
20. (a) 22 cm 2  
*B1 for 22*  
*B1 (indep) for cm*
- (b) 15 2  
 6 + 9  
*M1 for 5 × 3 or 6 + 6 + 3 o.e.*  
*A1*
- [4]**
21. (a) 11 1  
*B1 for 11*
- (b) 18 cm 2  
*B1 for 18*  
*B1 (indep) for cm*
- [3]**

22. (a) (i) 8 3  
*B1 cao*
- (ii) 45  
*B1 cao*
- (iii) 4  
*B1 cao*
- (b) 160 2  
 $(24 + 16) \div 2 \times 8$   
*M1 for valid method that could lead to a correct answer  
 (ie  $20 \times 8$ )  
 A1 ft from (a) (i)*
- [5]**
- 
23. (a) 9 2  
*B2*
- (b) Pentagon 1  
*(B1 for  $8 < \text{answer} < 10$ )  
 B1*
- [3]**
- 
24. (i) 12 1  
*B1*
- (ii) 22 2  
*B2 f.t for  $2 \times \text{"(i)"}$  – 2 correctly evaluated  
 (B1 for  $21 \leq \text{answer} \leq 23$ )*
- [3]**
- 
25. (a) 18 cm 2  
*B1 for 18  
 B1 (indep) for cm*
- (b) 12 2  
*B2 for 12  
 (B1 for  $4 \times 3$  or  $11 \leq \text{Answer} \leq 13$ )*
- [4]**

26.  $6 \text{ cm}^2$  3  
*B2 for 6*  
*(B1 for  $5.5 < \text{Area} \leq 7$ )*  
*then B1 (indep) for  $\text{cm}^2$*  [3]
27. (a)  $4 \times 3$  2  
 12  
*M1 for  $4 \times 3$  or rectangle divided into 4 by 3 grid*  
*A1*
- (b) 14 1  
*B1* [3]
28. (a) 8 2  
*M1 for counting squares (or answer between 7 and 9)*  
*A1 cao*
- (b) isosceles 1  
*B1*
- (c) A and F 1  
*B1 for both* [4]
29. (a) 14 1  
*B1 cao*
- (b) 7.5 2  
*B2 for 7.5 oe*  
*(B1 for  $7 \leq \text{answer} \leq 8$ )* [3]

30.  $16 \text{ cm}^2$  2  
*BI for 16*  
*BI (indep) for  $\text{cm}^2$*  [2]
31.  $4.5 \times 2.5$   
 $11.25$  2  
*M1 for  $4.5 \times 2.5$  or sight of digits 1125*  
*A1 for 11.25* [2]
32. (a)  $3e + 2f$  1  
*BI*
- (b)  $4xy$  1  
*BI* [2]
33. (a) 16 1  
*BI cao*
- (b) 12 1  
*BI cao* [2]
34. (a) 26 1  
*BI cao*
- (b) 30 1  
*BI cao* [2]
35. C [1]

36. D [1]
37. D [1]
38. C [1]
39. (a) 12 1  
*Bl cao*
- (b) 8 1  
*Bl cao*  
*[If no answer on the answer line, check the diagram]* [2]
40. (a) 16 1  
*Bl for 16 cao*
- (b) 15 1  
*Bl for 15 cao*
- (c) rectangle 1  
*Bl for rectangle, quadrilateral, trapezium, parallelogram or oblong* [3]
41. B [1]
42. A [1]
43. C [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. Many candidates gave the correct answer of  $60^\circ$  in part (a) although answers of  $45^\circ$  and  $120^\circ$  were not uncommon. In part (b) the angle marked  $y$  was usually calculated by using the sum of angles at a point or by dividing the sum of the angles of a hexagon by 6. However, many candidates used  $360^\circ$  as the angle sum of a hexagon. The majority of candidates appreciated that six triangles were needed in part (c) and attempted to evaluate  $6 \times 2\text{cm}^2$  but it was disappointing that a significant number of them then calculated  $6 \times 2^2$ , leading to an answer of 24.

### 3. Mathematics A Paper 1

#### Paper 1

Only 8% of candidates gave a fully correct answer to this question. More than half (55%) gained no marks whilst 37% gained 1 mark either from writing the units or the area of 10.

#### Paper 3

This question provided a straightforward start to the paper and most candidates worked out the area of the carpet correctly. The most common incorrect answer was 14, the perimeter of the shape.

#### Mathematics B Paper 14

Working out the area of a 5m by 2m rectangle proved to be less successful than one might have hoped for with only 34% scoring 1 mark and 8% scoring both marks. There is still some doubt about the difference between area and perimeter with the modal response being 14 obtained by adding the four lengths together. Many of those candidates who multiplied getting an answer of '10' then did not include the correct units thus losing a mark.

4. Although both parts of this question were reasonably well answered, confusion between area and perimeter was evident in part (a) with the reversal of the two answers and answers of 4 to part (ii). In part (b),  $40 (4 \times 5 \times 2)$  was the most popular wrong answer.
5. This question was answered well with many candidates gaining three or four marks. Candidates were least successful in part (iii) where a common error was for the area of the parallelogram to be found by multiplying the lengths of two adjacent sides. Some candidates answered part (i) incorrectly but then obtained follow through marks for parts (ii) and (iii).

**6. Specification A**

Many candidates were familiar with the term “hexagon” and scored the mark in the first part, minor spelling errors not being penalised. In the second part, a significant number of candidates did not appreciate that the question related to angle facts and instead referred to tessellations. One mark for the appearance of 360 was the most common award with fully correct responses being relatively rare. The final part was very well answered. Even those who tried to add the correct lengths but made an error scored one mark, if they showed their working, further evidence, if it were needed, of the advisability of doing this. 240 ( $30 \times 8$ ) was a common error and 38 ( $30 + 8$ ) appeared occasionally.

**Specification B**

(b) This was another example of candidates not reading the question properly as a number of candidates focussed on giving the reason why some shapes tessellate and others do not, as their answer and not why the angle was  $135^\circ$ . Fewer than 25% of the candidates were able to score any marks on this question. The first mark could be scored either by recognising that there was a right angle (or a  $90^\circ$ ) angle in the diagram or by realising that  $360^\circ$  was involved in the answer. Only 2% of the candidates were able to state that the sum of the angles around a point was  $360^\circ$ . Candidates need to be made aware that giving reasons requires more than just a calculation.

(c) Nearly two thirds of the candidates were able to provide the correct answer of 136. However many felt that the shape had 8 sides, 4 of which were 30cm in length and the other 4 all being 8 cm in length reaching a perimeter of 152 cm. Others merely multiplied 30 by 8 which led to an answer of 240.

7. In part (a), many candidates gave the right answer, 6, for the numerical value and, when units were given, they were usually correct. Most candidates attempted the enlargement in part (b) and many scored either both marks for a completely correct drawing or one mark for a drawing in which at least two sides were the correct length. In the latter case, though, responses varied from those who narrowly missed full marks to those who, possibly more by luck than judgement, had just two sides correct., often either the two shorter sloping sides or the two shorter vertical sides. There were some attempts to enlarge by a scale factor of 3 and reflections also appeared but neither of these was common. A variety of methods was used. Some drew construction lines, which was generally successful, but most just doubled the lengths, based on the grid squares, and the majority of shapes were neatly drawn using a ruler. Occasionally, candidates made more than one drawing, giving the examiner a choice of answers. It is not in candidates’ interests to do this, as the mark they are awarded will be that for the poorest answer.
8. Many candidates could not differentiate between area and perimeter in part (a) but they gained more success in finding the area (68%) but only 45% could find the perimeter. Candidates were more successful in finding the lines of symmetry with 72% gaining both marks and in part (c) the correct volume was given by 63% of candidates. Here candidates usually missed out the hidden cubes in the prism.

9. Many candidates found this unstructured question a difficult one to work through but, even so, about one quarter managed a completely correct solution. Many candidates worked out either the area or the perimeter and multiplied this by both £11.44 and £4.81, but a significant number calculated both the area and the perimeter and multiplied these by the correct amount. Unfortunately some divided by the cost. Some candidates calculated the cost of the hedge for each side rather than using the perimeter of the field but sometimes used only two sides. Most candidates made a correct comparison between their total and £23000. Often, good candidates rounded values within their working and lost the necessary accuracy.
10. Even though candidates were clearly told to state the units of their answer, many failed to write any units, whilst others just wrote cm. It was disappointing to find that candidates are still confusing area with perimeter, with over 60% of the candidates not able to provide the correct perimeter. Part (c) required candidates to find the volume of the prism with counting the cubes being the simplest method. Around a third of the candidates were successful in this task.

#### 11. Foundation Tier

Around a third of the candidates were able to score at least one mark by recognising that the area of any of the rectangles was obtained by multiplying the base by its height with around 14% going on to score all 3 available marks. However many stopped after calculating just one area. The most popular incorrect response was to add an assortment of the numbers given on the diagram. Several candidates had the correct working of  $80 - 24$  but then their arithmetic let them down, with 66 being a common incorrect difference between the two areas.

#### Intermediate Tier

Many candidates achieved full marks on this question. The weakest candidates carried out calculations related to perimeter, or did some adding before multiplying. Of the remainder the only common errors were those relating to arithmetic errors such as in  $2 \times 4$ ,  $8 \times 3$  or  $80 - 24$ .

#### 12. Foundation Tier

Foundation tier candidates often mistake perimeter and area. This question was no exception. Only 30% of candidates were able to correctly find the area of the rectangle. The majority of candidates gave the answer of 14, the perimeter! In part (b) where they had to square root the area to find the length of one side only 3% of candidates gave the correct answer of 18. Mostly they divided 324 by 4 to get 81.

**Intermediate Tier**

About 85% of candidates worked out the area of the rectangle correctly in part (a). The most common mistake was to calculate the perimeter rather than the area. In part (b) it was more common to see an answer of 81 (obtained by dividing 324 by 4) rather than the correct answer of 18. Some of those who were successful used trial and improvement to determine which number squared to make 324 rather than find the square root of 324.

13. Fewer candidates than in the past are getting confused between area and perimeter. Whilst the first part of this question was completed successfully by over 60% of candidates, answers to parts (b) and (c) were more susceptible to careless mistakes. Just under a half of the marks were earned in these two parts.

**14. Foundation Tier**

This question was understood by candidates but caused the usual problems when candidates misunderstood the difference between perimeter and area. Candidates gained most success with find the volume by counting cubes, though they sometimes forgot the hidden ones.

**Intermediate Tier**

Part (a) was answered very well. Errors usually arose from candidates making a mistake when adding 5 or from giving a term in the sequence other than the 10th term. The most common incorrect answers were 42, 52 and 44 (obtained by doubling the 5th term). Finding the  $n$ th term of a sequence continues to cause problems at this level and in part (b) less than 20% of candidates answered (i) correctly. The most common incorrect answer was  $n + 3$ . Those who did find  $3n$  sometimes either stopped or failed to find  $-7$  correctly.  $3n - 1$  was quite a common answer. It was apparent that many candidates did not read the question properly in (ii) because far too many gave only one number as the answer. This answer was usually a correct term, which showed some understanding but gained no marks.

15. It is disappointing to have to report that only slightly more than half of all candidates achieved the marks in any part of this question. Errors include confusion between area and perimeter, and errors in simple counting of lines, squares or cubes. Even more able candidates were found to have errors in this question.
16. Although some was seen, there seemed less confusion between perimeter and area than in the past. Part (a) was successfully answered by over 80% of candidates. Some candidates only added the two sides given and gave 30 as their answer. Examiners rarely saw any working in part (b). Over 60% of candidates gained both marks in this part of the question.

17. In parts (a) and (b), many candidates were confused in distinguishing between perimeter and area. Many gave 12 as their answer to part (a). In part (b), the omission of units was common, even when the area was correct. In part (c), many candidates successfully found the correct volume by working out  $5 \times 3$  or more usually by simply counting the cubes. The most common errors seen were either calculations of  $3 \times 3 \times 3 (= 27)$  or mistakes in counting methods leading to answers of 13 and 14, which gained 1 mark, and sometimes 12 which gained no credit.
18. Many candidates were able to obtain the 29 for part (a) but only about 10% of the candidates wrote the units ( $\text{cm}^2$ ).  
A considerable number of candidates confused area and perimeter and wrote the answers the wrong way round.
19. 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.
20. Surprisingly counting the 1 cm edges of the squares was rarely done correctly even in those cases where the candidate had numbered the edges. The most common incorrect total was 21 with the inside corner causing some problems. The omission of the cm unit on the answer line lost the second mark in this part. Part (b) was often answered correctly but for some there appeared to be a visualisation difficulty as the candidates struggled to either count the 1 cm cubes or devise a mathematical way of working out the volume.
21. This type of question, namely asking for an area and a perimeter, has appeared in a number of past papers yet it still leads to confusion in distinguishing between them. There were many correct area results (75% of candidates) achieved by simply counting the squares in the diagram. The perimeter might have been dealt with in a similar way by totalling the edges. However some resorted to more complex methods often leading to an incorrect answer. Fewer than half the candidates were able to correctly write down the correct perimeter of the shape. Over 80% of the candidates lost a mark by omitting the unit required in (b). Others lost the mark as  $\text{cm}^2$  put in a regular appearance.

22. All three parts of (a) were often correct but, if an error was made, it was usually in part (ii) where 180 appeared frequently. 64 was seen on occasions in part (iii). Over 90% of candidates scored 2 or more marks in (a).  
Part (b) was less well done, a third scoring one or two marks. Use of the given formula often led to correct substitution but inaccurate calculation was not uncommon. Greater success was achieved by those choosing to split the trapezium into a rectangle and a triangle and then summing the parts. A variety of answers appeared regularly, including 48 ( $16 + 8 + 24$ ), 192 ( $8 \times 24$ ), 128 ( $8 \times 16$ ) and 3072 ( $8 \times 16 \times 24$ ). Candidates making arithmetic errors could still gain credit by making their method clear.
23. (a) Working out the area of the polygon required an allowance to be made for the partially shaded squares. Although there was little evidence of calculations the correct answer of '9' appeared in over 60% of the responses. The most common incorrect area was '11' and arose through counting how many squares had been completely or fractionally shaded.  
(b) The mathematical name of the shape was recognised as being a 'pentagon' in only 17% of the responses. For some 'trapezium' was suggested. Others chose to use the word 'polygon', which had been given in the question, whilst variations on this were also in evidence with 'polygoner', 'polygram' and 'poligonic triangle' appearing.
24. Finding the area of the top face of the prism could have been done by counting the squares. As many as 79% obtained the correct result. Finding the volume of the prism seemed more difficult as it required an allowance to be made for the half cubes at each end. Only 24% scored both available marks. Multiplying the area of the top face by two, without any account being made for the half cubes, produced an incorrect answer of '24', which was frequently seen.
25. Fewer than 14% of the candidates wrote any units for their answer to part (a) thereby not scoring this available mark. Only 12% of candidates scored both available marks for part (a). The most common incorrect responses were 20 (the area of shape A) and 22 (possibly from counting the 4 corners too). There was more success in part (b) where nearly 60% of the candidates scored both marks, generally by counting the squares.
26. Candidates found it challenging to cope with the partial squares preferring to attempt to add the sides, even though they were not all whole centimetres, to achieve an answer of 11. Despite the sentence "State the units with your answer" clearly visible, the majority of candidates did not provide units with their answer with  $\text{cm}^2$  rarely seen.

27. Working out the area of the '4 by 3' rectangle should have been a straight forward calculation but it proved to be otherwise with less than half obtaining the correct result. Various inking of '4' and '3' were suggested with '4 + 3 + 4 + 3' being the most common. There is still considerable confusion between area and perimeter as demonstrated by the answer to the second part of the question, with just under 60% obtaining the correct answer of 14. Perhaps a thorough revision of the topic prior to the examination might prove to be beneficial and help to distinguish between the two types of calculation involved.

28. Finding the area of the square was dealt with correctly by two-thirds of candidates using the method of counting grid squares. Naming the triangle in part (b) was rather more of a challenge with only half the candidates obtaining an answer that could be identified as 'isosceles'. Apart from the numerous different spellings of 'isosceles', which were rewarded, a variety of other names were given. The special name for the triangle was written as 'triangle', 'quadrilateral' and even 'trianglepezium' along with attempts at 'equilateral' which left me still trying to visualise a 'squarpizeim'! Recognition of congruent shapes in part (c) produced the correct answers in just under 60% of cases with many incorrectly selecting shapes B and E.

29. Fewer than half the candidates were able to correctly provide the perimeter of the shape in part (a). The most common incorrect response was to provide the area giving 9 as the answer. In part (b) there was more success in finding the area of the shape with over half the candidates able to successfully cope with the half squares.

30. Whilst most candidates attempted this question only a small proportion (21%) gained both of the marks available. Well over half of candidates gave the correct answer for the area, but less than half gave any units in their answer despite this being explicitly asked for in the question. Some candidates confused perimeter and area though this was seen less frequently than has been the case in the past.

### 31. Foundation Tier

Finding the area of the rectangle involved the calculation '4.5 x 2.5' which, on a calculator paper, should have produced a high level of success. As it was, nearly three quarters of the candidates failed to score any marks on this question. Written attempts at a long multiplication gave rise to the impression that the candidates did not have access to a calculator. There is still a need to distinguish between the words 'area' and 'perimeter' and their associated processing. Many offerings of  $4.5 + 2.5$  or  $4.5 \times 2$  with  $2.5 \times 2$  were seen as they worked towards finding the perimeter. There were some more practical attempts by dividing the area up into squares which came pretty close to achieving a result but fell short in dealing with the ' $0.5 \times 0.5$ ' square. Others used a calculator but rounded their answer. Where working was not shown, answers of 11, 11.2 and 11.3 scored no marks. Again candidates should be encouraged to show all working, no matter how trivial it may seem to them.

**Intermediate Tier**

The great majority of candidates were successful in finding the correct area of the given rectangle, however the request for units confused many. Units of cm, or no units given at all, were common mistakes. Some used the two part answer line to separate the 11 and the.25, sometimes omitting the decimal point. A few weaker candidates either found the perimeter or doubled their product of 11.25. Other common errors were:  $4.5 \times 4.5 \times 2.5 \times 2.5$  and  $4.5 \times 2 \times 2.5 \times 2$ .

32. Part (a) was usually correctly answered, however when errors were made the most common incorrect answer was  $e^3 + f^2$ . In part (b), most candidates gained the mark. Often answers were left incomplete,  $5xy - xy$  being the usual part solution.
33. Only half the candidates were able to provide the correct perimeter of the shaded shape but 68% could work out its area accurately. The most common error was to mix up the two concepts.
34. An answer of 30 cm was a common error for the perimeter in part (a). It was not clear if this was a result of confusing perimeter with area or the result of counting the actual squares surrounding the perimeter of the shaded region. Other errors generally related to careless counting. Candidates were generally more successful in answering part (b).
35. No Report available for this question.
36. No Report available for this question.

37. No Report available for this question.

38. No Report available for this question.

39. In part (a), the most common errors were 16 (the sum of the squares around the outside of the given rectangle) and 8 (the area) although the great majority gained the mark.

Part (b) was answered better with only a few candidates confusing area and perimeter and giving an answer of 12.

40. A well understood question by most candidates; however a significant minority mixed up area and perimeter and some candidates found the area and perimeter of the grid on which the shaded shape was drawn. Almost all candidates wrote rectangle for the shape though some candidates did write quadrilateral, square or even kite.

41. No Report available for this question.

42. No Report available for this question.

43. No Report available for this question.