

**GENERAL CERTIFICATE OF SECONDARY EDUCATION  
MATHEMATICS SYLLABUS A**

**J512/02**

Paper 2 (Foundation Tier)

**MONDAY 2 JUNE 2008**

Afternoon  
Time: 2 hours

Candidates answer on the question paper  
**Additional materials (enclosed):** None

**Additional materials (required):**  
Electronic calculator  
Geometrical instruments  
Tracing paper (optional)



Candidate  
Forename

Candidate  
Surname

Centre  
Number

--	--	--	--	--

Candidate  
Number

--	--	--	--

**INSTRUCTIONS TO CANDIDATES**

- Write your name in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Show your working. Marks may be given for a correct method even if the answer is incorrect.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided.

**INFORMATION FOR CANDIDATES**

- The number of marks is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is **100**.
- You are expected to use an electronic calculator for this paper.
- Use the  $\pi$  button on your calculator or take  $\pi$  to be 3.142 unless the question says otherwise.

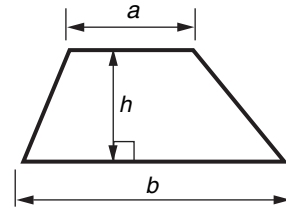
**FOR EXAMINER'S USE**

--

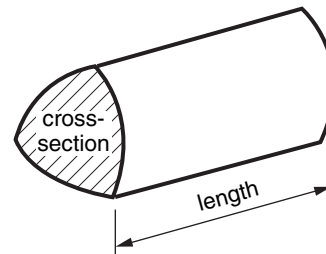
This document consists of **20** printed pages.

## Formulae Sheet: Foundation Tier

**Area of trapezium** =  $\frac{1}{2} (a + b)h$



**Volume of prism** = (area of cross-section)  $\times$  length



**PLEASE DO NOT WRITE ON THIS PAGE**

1 Here is a list of numbers.

6    7    9    11    13    20    26    47    51

(a) From this list, write down

(i) an even number,

(a)(i) \_\_\_\_\_ [1]

(ii) a square number,

(ii) \_\_\_\_\_ [1]

(iii) two numbers that add to give 37,

.....

(iii) \_\_\_\_\_ and \_\_\_\_\_ [1]

(iv) two numbers that subtract to give 25.

.....

(iv) \_\_\_\_\_ and \_\_\_\_\_ [1]

(b) (i) From the same list, write down a multiple of 5.

(b)(i) \_\_\_\_\_ [1]

(ii) Explain how you know that this is a multiple of 5.

\_\_\_\_\_  
\_\_\_\_\_ [1]

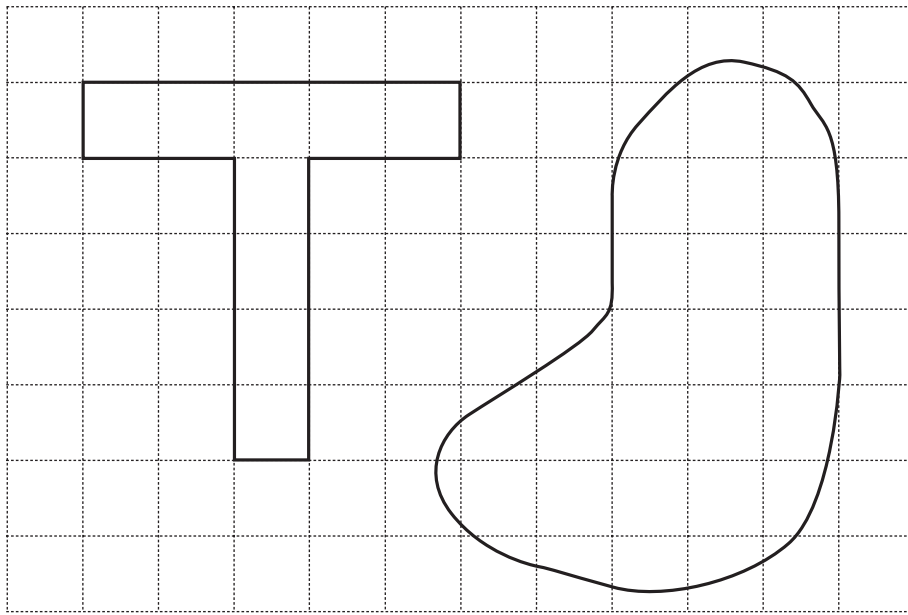
(c) (i) Which number in the list is a factor of 33?

(c)(i) \_\_\_\_\_ [1]

(ii) Explain how you know that this is a factor of 33.

\_\_\_\_\_  
\_\_\_\_\_ [1]

2 The shapes below are drawn on a grid of 1 cm squares.



(a) Find the perimeter of the T shape.

.....  
 .....

(a) \_\_\_\_\_ cm [1]

(b) Find the area of the T shape.

.....  
 .....

(b) \_\_\_\_\_ cm<sup>2</sup> [1]

(c) Estimate the area of the curved shape.

.....  
 .....

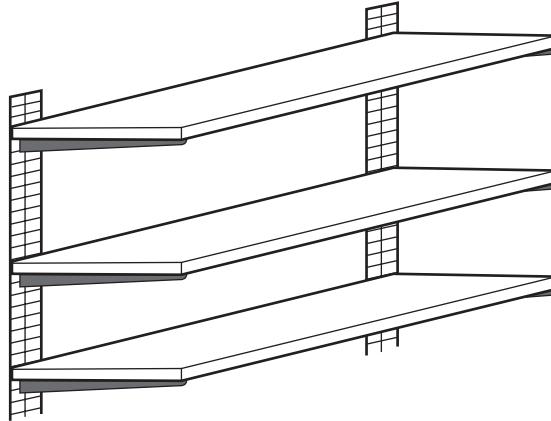
(c) \_\_\_\_\_ cm<sup>2</sup> [2]

(d) Describe a method you could use to estimate the perimeter of the curved shape.

.....  
 .....

[1]

3 (a)



Tina wants to build some shelves in her bedroom.  
She goes to the DIY store to buy what she needs.

Fill in the 5 gaps in her bill.

.....

.....

.....

2 supports at £3.55 each.	£ _____
3 pairs of brackets at £2.49 for each pair.	£ _____
5.4 metres of shelving at £2.20 per metre.	£ _____
3 packets of screws at _____ per packet.	£ 1.86 _____
<b>TOTAL</b>	£ _____

[5]

(b) Alan has £20.  
He wants to buy some football magazines.  
They cost £2.99 each.

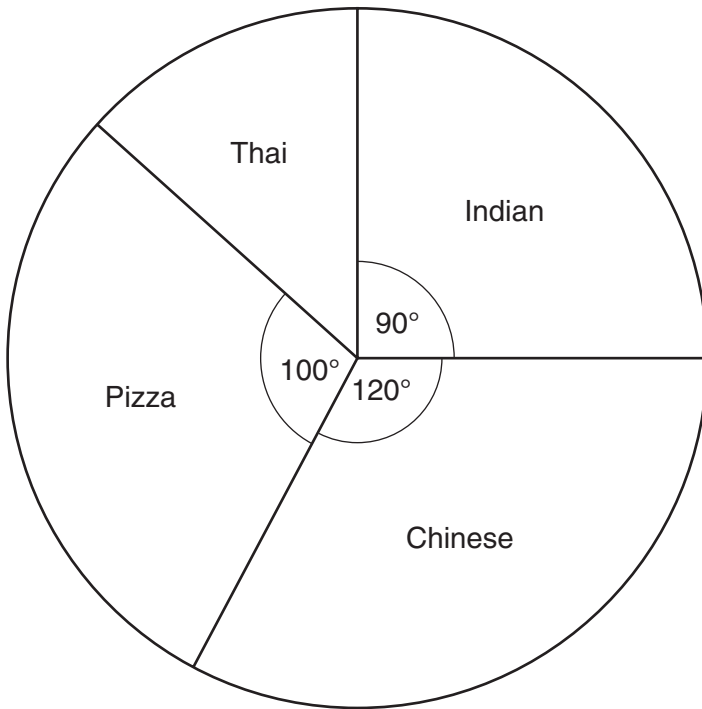
What is the greatest number of football  
magazines that Alan can buy?



.....

.....

(b) \_\_\_\_\_ [2]



NOT TO SCALE

This pie chart represents the favourite takeaway foods of 180 students.

(a) Which takeaway food was the favourite of  $\frac{1}{4}$  of these students?

.....

(a) \_\_\_\_\_ [1]

(b) What fraction of these students chose Chinese?

.....

(b) \_\_\_\_\_ [1]

(c) Work out the size of the angle for Thai.

.....

.....

(c) \_\_\_\_\_ ° [2]

(d) How many of the 180 students chose Pizza?

.....

.....

.....

(d) \_\_\_\_\_ [2]

- 5 The table shows the distances, in miles, between some places in England. For example, the distance between Birmingham and Shrewsbury is 48 miles.

	Birmingham					
56		Gloucester				
59	34		Hereford			
56	79	111		Northampton		
68		81	44		Oxford	
48	96	52	98	120		Shrewsbury

(a) (i) How far is it from Birmingham to Northampton? (a)(i) \_\_\_\_\_ miles [1]

(ii) The distance between Gloucester and Oxford is 12 miles less than the distance between Birmingham and Hereford.  
Fill in the gap in the table.

.....[2]

(iii) Pranav left Birmingham and went to Northampton. From Northampton he went to Oxford and then straight back to Birmingham. Work out how far he travelled altogether.

.....  
.....

(iii) \_\_\_\_\_ miles [2]

(b) This word formula connects *distance*, *speed* and *time*.

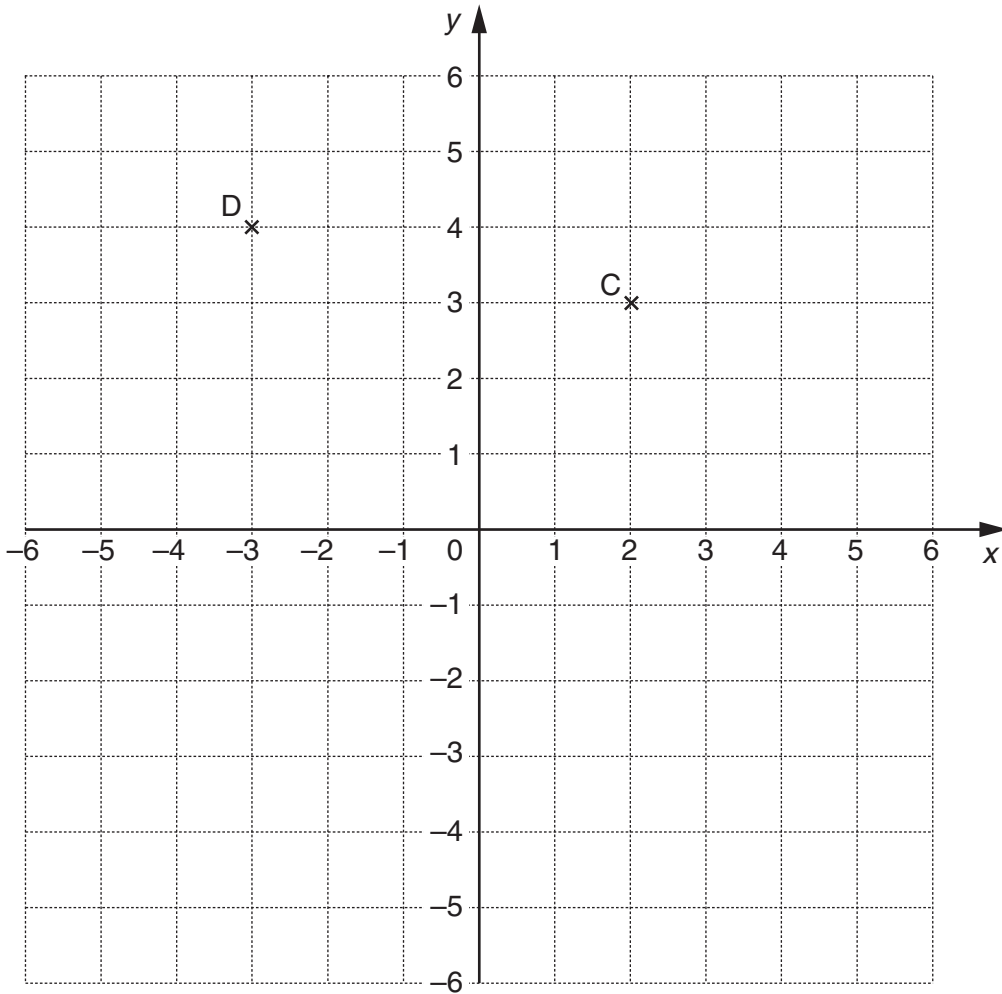
*“Time equals distance divided by speed”*

Pranav went from Oxford to Shrewsbury at a speed of 40 miles per hour. Work out how long it took him.

.....  
.....

(b) \_\_\_\_\_ hours [2]

6



(a) Write down the coordinates of the points C and D.

(a) C ( \_\_\_\_\_ , \_\_\_\_\_ ) [1]

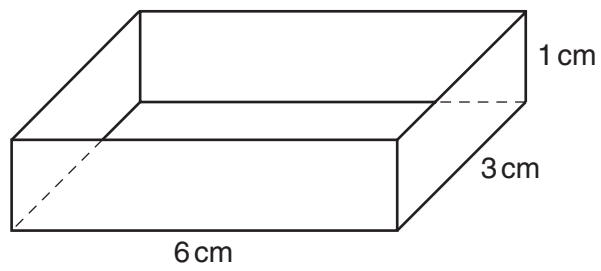
D ( \_\_\_\_\_ , \_\_\_\_\_ ) [1]

(b) Plot and label the points E (-5, -4), F (1, -5) and G (0, -3).

[3]



- 7 (a) This is a diagram of an open box.

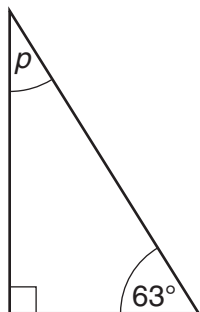


Draw a net of the open box.



[3]

- (b) (i) Calculate the size of angle  $p$ .  
Give a reason for your answer.

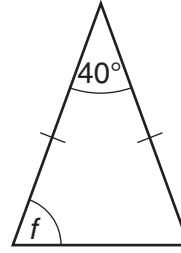


NOT TO  
SCALE

.....  
 $p =$  \_\_\_\_\_  $^\circ$  because \_\_\_\_\_

[2]

(b) (ii) Calculate the size of angle  $f$  in this isosceles triangle.



NOT TO SCALE

.....

(b)(ii) \_\_\_\_\_ ° [2]

8 (a) Solve.

(i)  $x + 6 = 13$

.....

(a)(i) \_\_\_\_\_ [1]

(ii)  $4x = 12$

.....

(ii) \_\_\_\_\_ [1]

(iii)  $2x + 5 = 10$

.....

.....

(iii) \_\_\_\_\_ [2]

(b) (i) Use the formula  $y = 3t + 2$  to work out the value of  $y$  when  $t = 13$ .

.....

(b)(i) \_\_\_\_\_ [2]

(ii) Use the formula  $M = A + 4B$  to work out the value of  $M$  when  $A = 12$  and  $B = -2$ .

.....

.....

(ii) \_\_\_\_\_ [2]

9 (a) Work out.

(i)  $\frac{3}{5}$  of 135

.....  
 .....

(a)(i) \_\_\_\_\_ [2]

(ii)  $2^5$

.....

(ii) \_\_\_\_\_ [1]

(iii)  $5^3$

.....

(iii) \_\_\_\_\_ [1]

(b) Work out.

$$2.1^2 + \sqrt{0.36}$$

.....  
 .....

(b) \_\_\_\_\_ [1]

(c) (i) Work out.

$$\frac{1}{0.41^2}$$

.....

Write down all the numbers on your calculator display.

(c)(i) \_\_\_\_\_ [1]

(ii) Write your answer to part (c)(i) correct to 1 decimal place.

(ii) \_\_\_\_\_ [1]

10 A bag contains 4 blue balls, 8 green balls and 5 white balls.  
A ball is taken from the bag at random.

(a) Find the probability that it is green.

.....  
.....

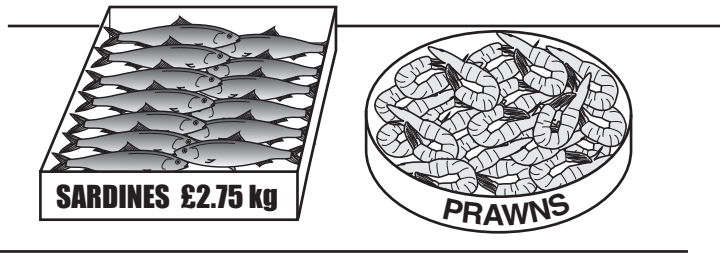
(a) \_\_\_\_\_ [2]

(b) The probability that it is red is zero.

Explain why this is true.

\_\_\_\_\_  
\_\_\_\_\_ [1]

11



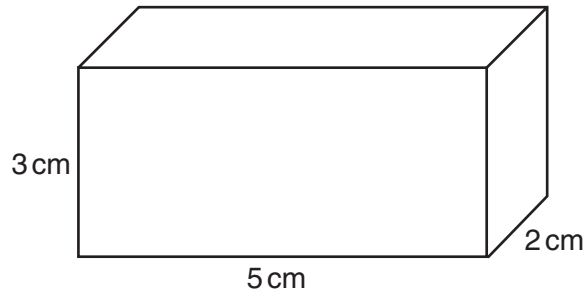
Maria goes to the fish stall.  
She buys 2 kg of sardines and 0.5 kg of prawns.  
The total cost is £7.70.  
The sardines cost £2.75 per kilogram.

How much per kilogram do the prawns cost?

.....  
.....  
.....  
.....  
.....

£ \_\_\_\_\_ [4]

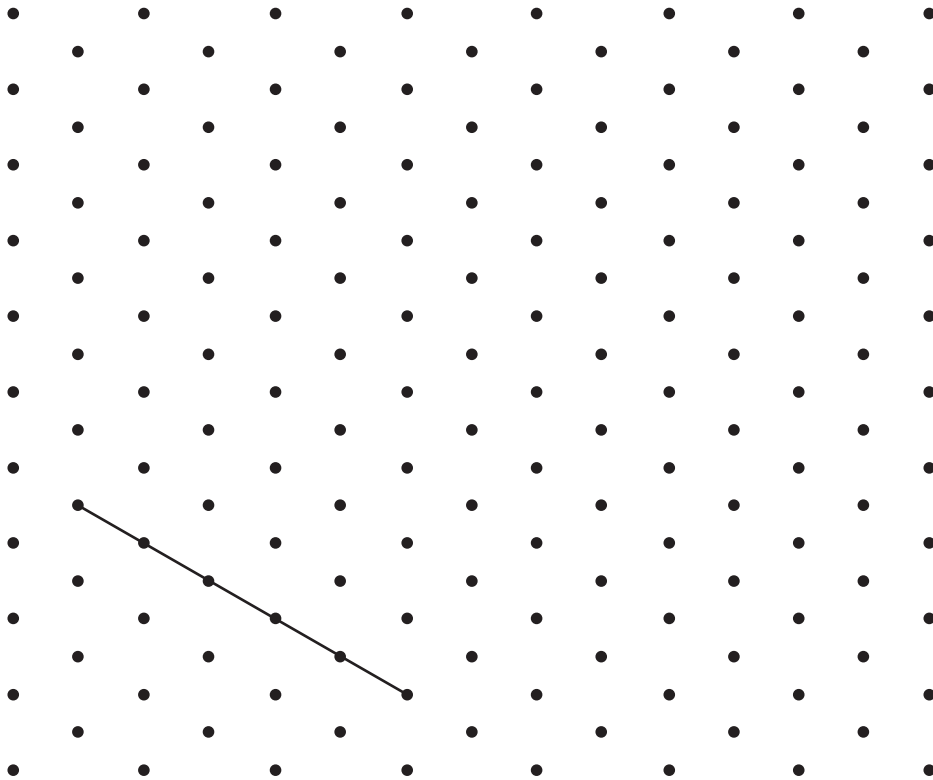
- 12 (a) Find the volume of this cuboid.  
Give the units of your answer.



.....  
 .....

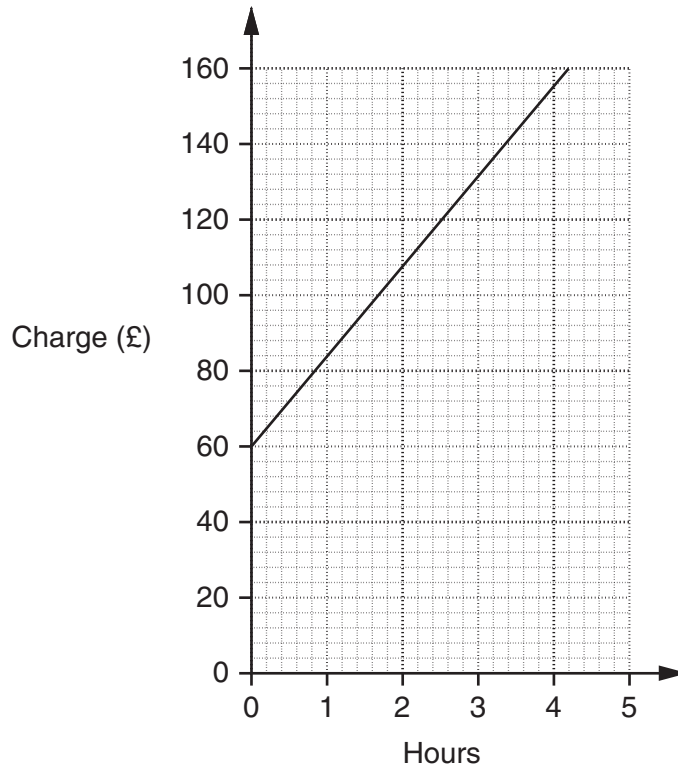
(a) \_\_\_\_\_ [3]

- (b) On the dotted paper below, make an isometric drawing of the cuboid.  
One of the 5 cm edges has been drawn for you.



[2]

13 An electrician uses this graph to work out how much to charge for each job.



The charge for a job is made up of a fixed fee plus an amount for the time that the job lasts.

(a) How much is the fixed fee?

(a) £ \_\_\_\_\_ [1]

(b) How much would the electrician charge for a job that lasts 5 hours?

.....

(b) £ \_\_\_\_\_ [1]

(c) The charge, £ $C$ , can be written as a formula in terms of the fixed fee, the rate per hour and the number of hours,  $h$ , for the job.

Complete the formula.

.....  
 .....

$C = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} \times h$  [2]

14 Clare is reading a poetry book.

- (a) The shortest poem in the book has one verse and the longest poem has six verses. The poems in the book are from ten to fifteen lines in length.

Design a two-way table for Clare to record the number of verses and the number of lines for the poems in the book.

[3]

- (b) Clare counted the number of letters in each word of one poem. There were 28 words in the poem.

She drew this table to show her results.

Number of letters	Frequency	
1	2	
2	5	
3	6	
4	8	
5	2	
6	3	
7	2	
Total	28	

Calculate the mean number of letters per word in the poem.

.....

.....

.....

.....

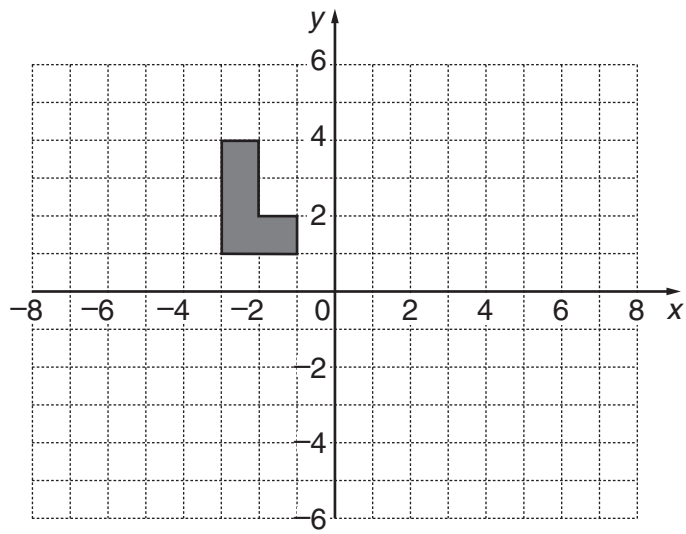
.....

.....

.....

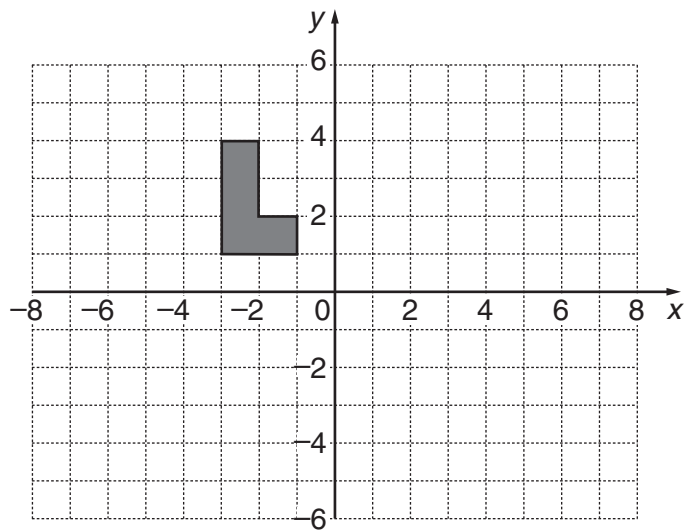
(b) \_\_\_\_\_ [3]

- 15 (a) Reflect the L shape in the line  $x = 1$ .



[2]

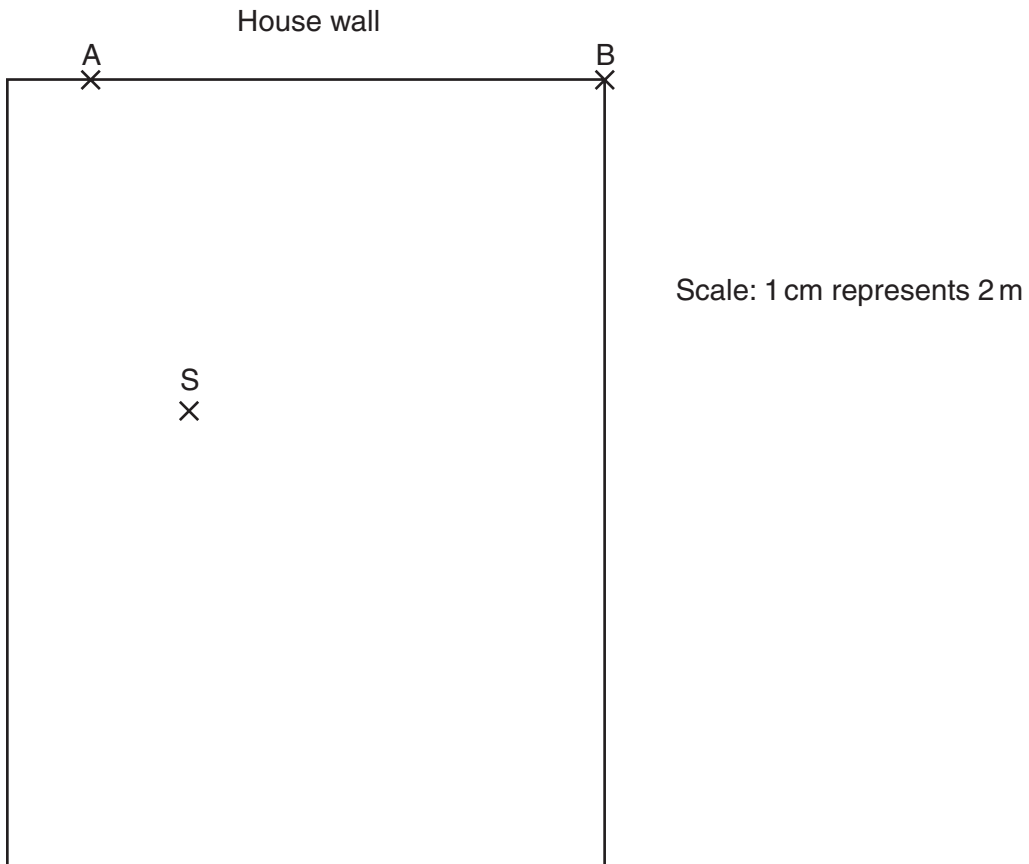
- (b) Rotate the L shape  $180^\circ$  about the origin.



[3]



- 16 The diagram shows the garden of a house.  
There is a security light, S, in the garden and two security lights, A and B, on the house wall.  
The lights are at ground level.



The security light in the garden comes on when it detects movement within 7 m.  
Each security light on the house wall comes on when it detects movement within 4 m.

A fox is in the garden.

Indicate clearly the region where the fox can move **without** making any of the security lights come on.

[3]

- 17 Lewis was baking bread.  
He made the dough and left it to rise.  
The volume of the dough before it had risen was  $680 \text{ cm}^3$ .  
The volume of the dough after it had risen was  $1258 \text{ cm}^3$ .

Calculate the percentage increase in the volume of the dough.

.....  
.....  
.....  
.....

\_\_\_\_\_ % [3]

---

- 18 Use trial and improvement to solve this equation.

$$x^3 + x = 8$$

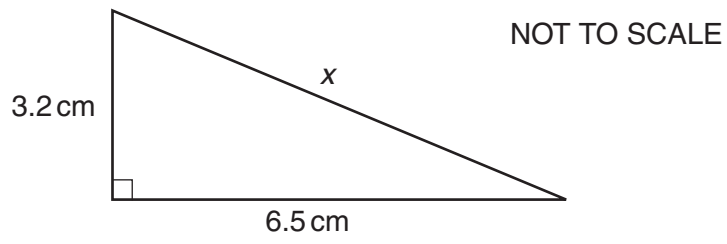
Give your answer to one decimal place.  
Show all your trials and their outcomes.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

\_\_\_\_\_ [4]

---

19 Calculate the value of  $x$ .



.....

.....

.....

.....

.....

.....

\_\_\_\_\_ cm [3]



**PLEASE DO NOT WRITE ON THIS PAGE**

---

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (OCR) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

OCR is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.