

Candidate forename						Candidate surname					
Centre number						Candidate number					

OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GENERAL CERTIFICATE OF SECONDARY EDUCATION

J512/02

MATHEMATICS SYLLABUS A

Paper 2 (Foundation Tier)

FRIDAY 10 JUNE 2011: Morning

DURATION: 2 hours

SUITABLE FOR VISUALLY IMPAIRED CANDIDATES

Candidates answer on the question paper.

OCR SUPPLIED MATERIALS:

None

OTHER MATERIALS REQUIRED:

Electronic calculator

Geometrical instruments

Tracing paper (optional)

READ INSTRUCTIONS OVERLEAF

INSTRUCTIONS TO CANDIDATES

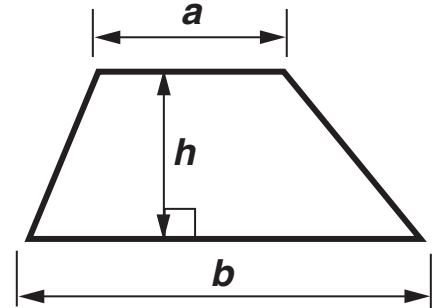
- Write your name, centre number and candidate number in the boxes on the first page. Please write clearly and in capital letters.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Show your working. Marks may be given for a correct method even if the answer is incorrect.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Answer ALL the questions.

INFORMATION FOR CANDIDATES

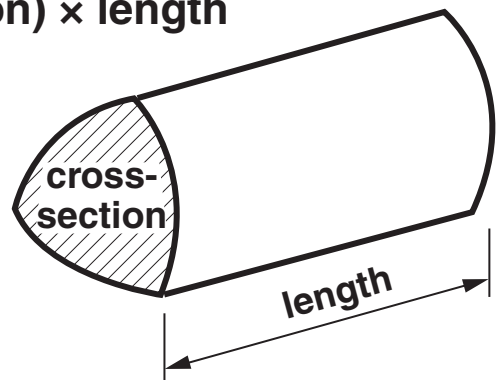
- The number of marks is given in brackets [] at the end of each question or part question.
- You are expected to use an electronic calculator for this paper.
- Use the π button on your calculator or take π to be 3.142 unless the question says otherwise.
- The total number of marks for this paper is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

Formula Sheet: Foundation Tier

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

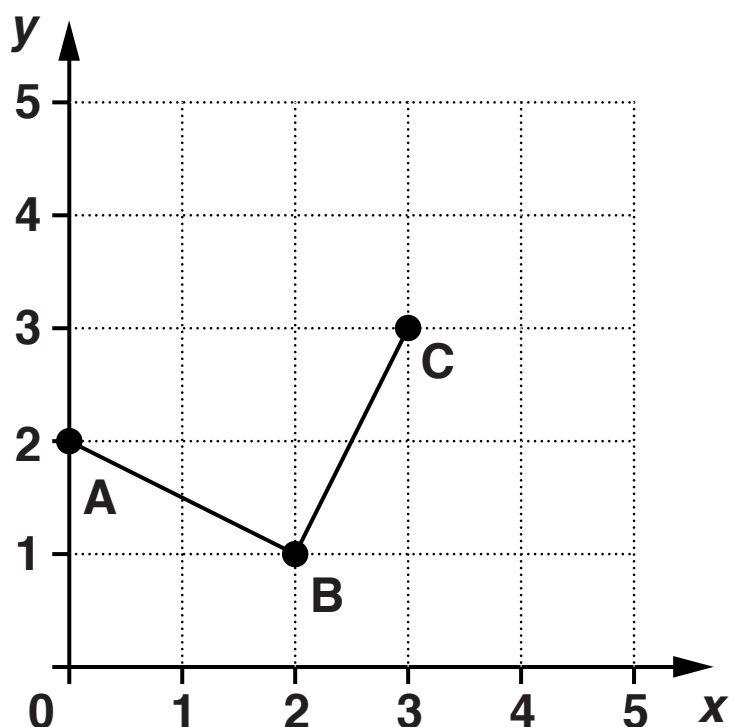


Volume of prism = (area of cross-section) \times length



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- 1 Use the grid below to answer the questions which follow.



(a) Write down the coordinates of point A.

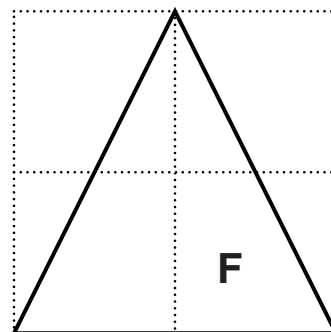
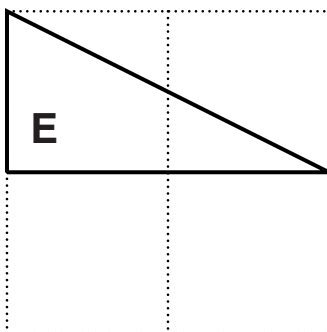
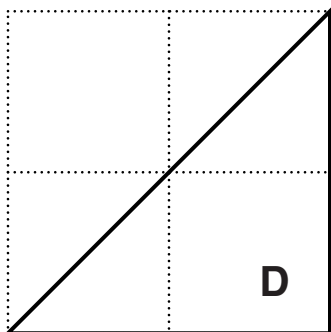
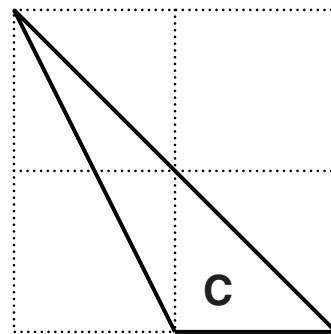
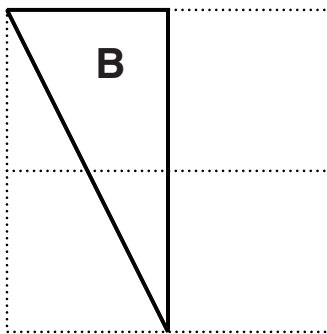
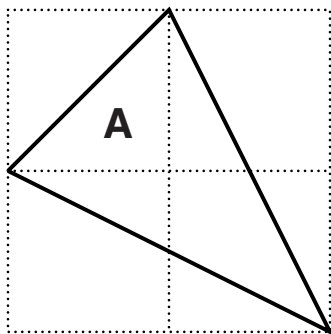
(a) (_____ , _____) [1]

(b) Write down the coordinates of point B.

(b) (_____ , _____) [1]

(c) Plot point D so that ABCD is a square. [1]

2 Rachel draws 6 triangles on square grids.



(a) Which triangle has an obtuse angle?

(a) _____ [1]

(b) Which triangle is isosceles AND has a right angle?

(b) _____ [1]

(c) Which two triangles are congruent?

(c) _____ and _____ [1]

(d) Which three triangles have a line of symmetry?

(d) _____ and _____ and _____ [1]

(e) Rachel says that triangle F is equilateral.

Explain why Rachel is wrong.

[1]

- 3 These are the temperatures in three European cities on a day in January.**

Berlin -11°C

London 5°C

Paris -2°C

- (a) How much warmer is Paris than Berlin?**

(a) _____ $^{\circ}\text{C}$ [1]

- (b) How much warmer is London than Berlin?**

(b) _____ $^{\circ}\text{C}$ [1]

- (c) The temperature in London that day is 18°C higher than the temperature in Montreal.**

What is the temperature in Montreal?

(c) _____ $^{\circ}\text{C}$ [1]

- 4 Jacob was given £95 for his birthday.
He spent £47.50 on a new phone and bought two
shirts costing £14.95 each.**

How much of the £95 does he have left?

£ _____ [3]

5 Use your calculator to work these out.

(a) the sum of 1026 and 389

(a) _____ [1]

(b) one third of 738

(b) _____ [1]

(c) the difference between 4.9 and 32

(c) _____ [1]

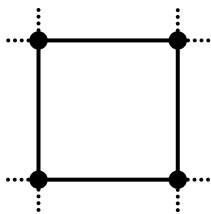
(d) 54 added to half of 328

(d) _____ [2]

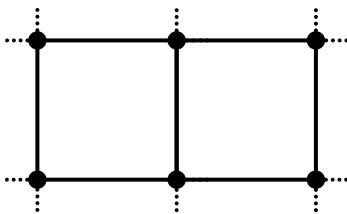
(e) the square root of 7.84

(e) _____ [1]

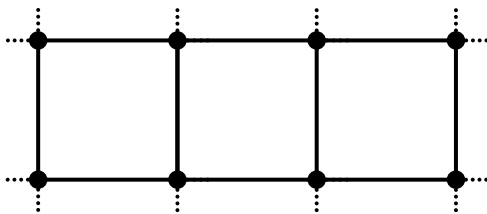
6 This is a sequence of dot patterns.



Pattern 1

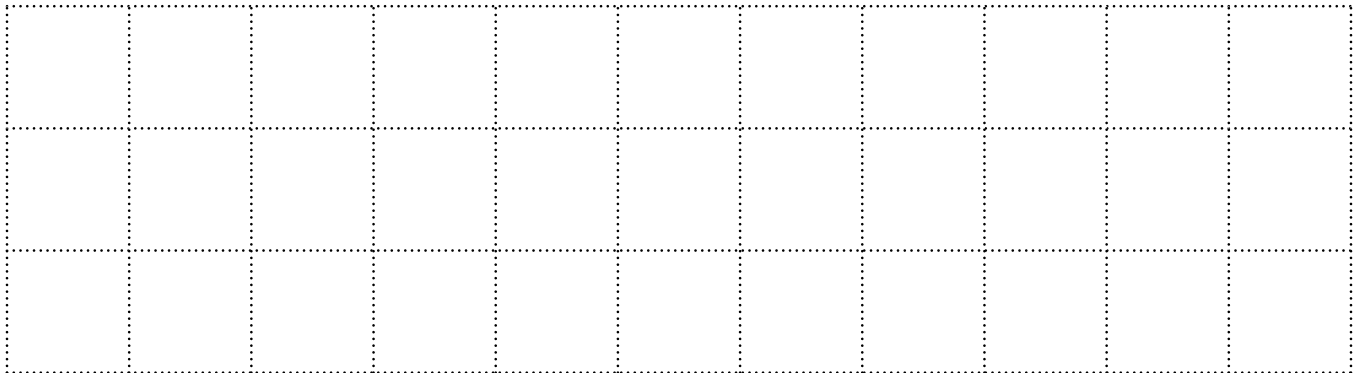


Pattern 2



Pattern 3

(a) Draw the next pattern in the sequence.



[1]

(b) Complete the table for this sequence.

Pattern number	1	2	3	4
Number of dots	4	6	8	

[1]

(c) How many dots will there be in

(i) Pattern 5,

(c)(i) _____ [1]

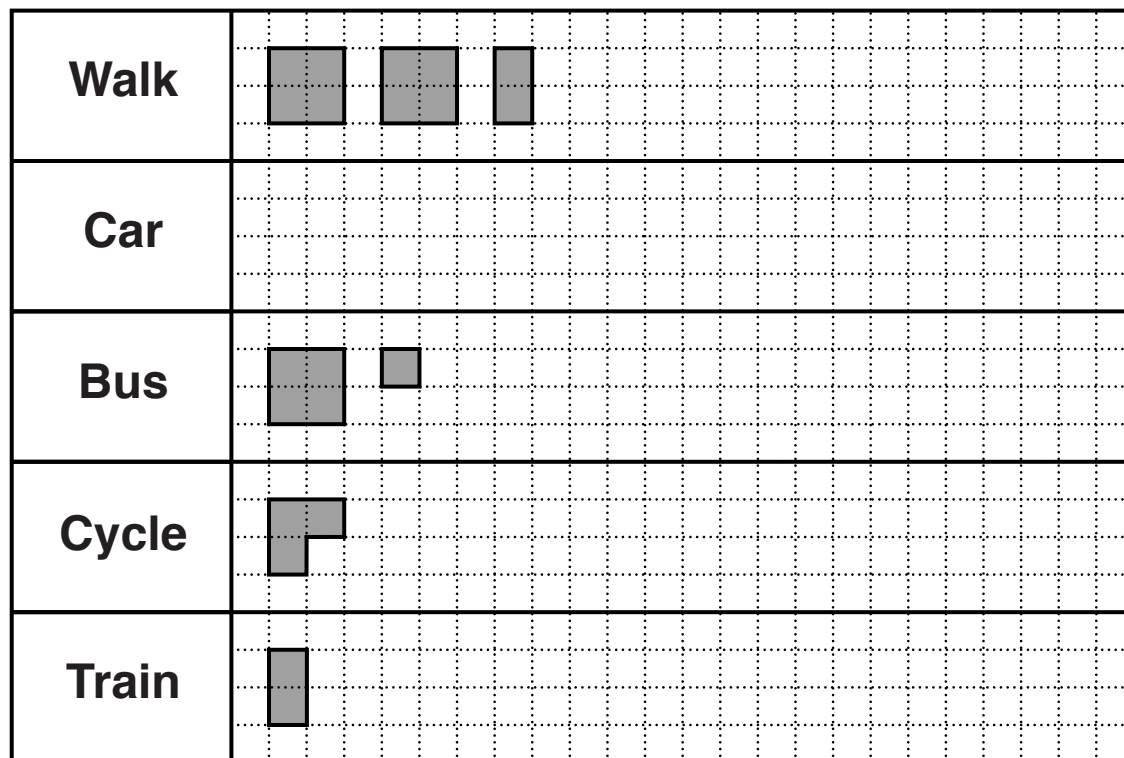
(ii) Pattern 12?

(ii) _____ [2]

(d) Explain why a pattern in this sequence cannot have 79 dots.

_____ [1]

- 7 In their environmental project a class recorded how they each travelled to school in the morning. They represented the results in this pictogram.



Key:  represents 4 pupils

(a) 6 pupils travelled by car.

Complete the pictogram.

[1]

(b) How many pupils travelled by bus?

(b) _____ [1]

(c) How many pupils walked or cycled to school?

(c) _____ [1]

- 8 A rectangle has length 6.8 cm and width 4.5 cm.**



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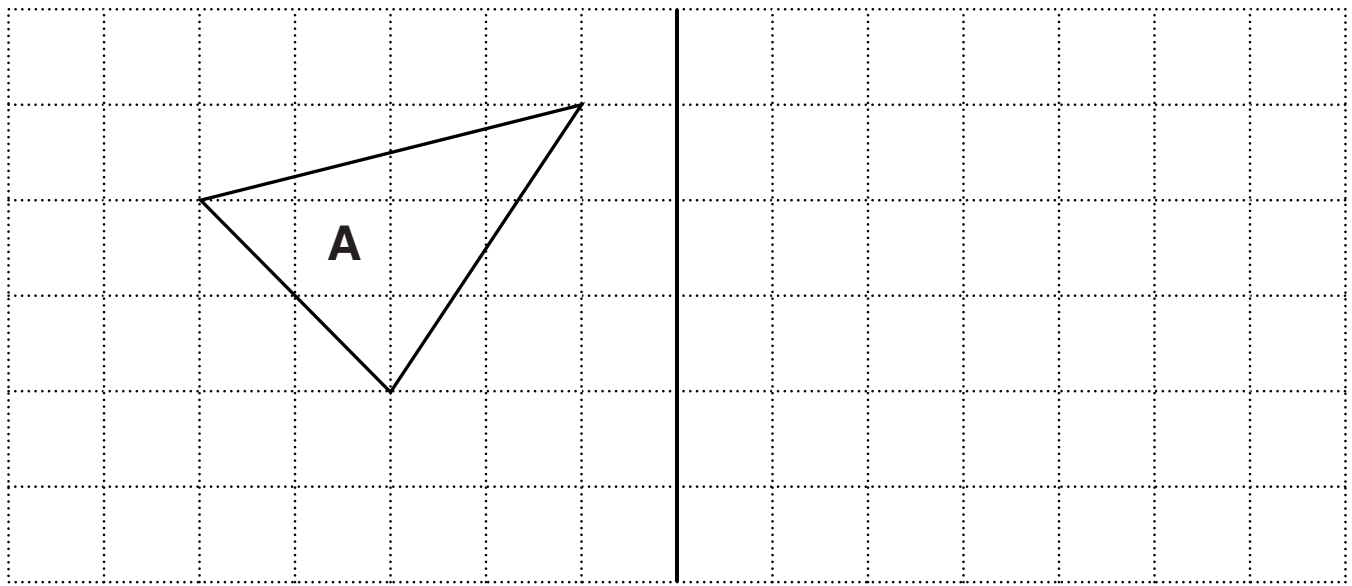
4.5 cm

6.8 cm

**Work out the area of the rectangle.
Give the units of your answer.**

_____ **[3]**

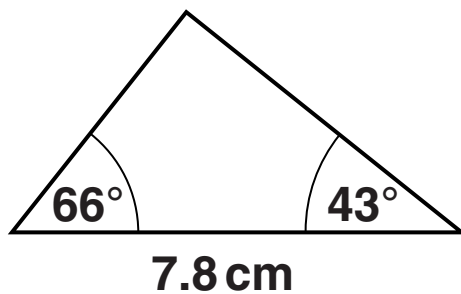
9 (a) Reflect triangle A in the mirror line.



mirror line

[2]

(b) Draw this triangle full-size in the space below.



NOT TO
SCALE

[3]

- 10 (a) Amy goes on a business trip to America.
The exchange rate is \$1.58 to £1.**

**How many dollars (\$) does Amy receive when she
changes £400?**

(a) \$ _____ [2]

- (b) When Amy returns from America, the exchange
rate is still \$1.58 to £1.
She changes \$120 into pounds.**

How much money does Amy receive?

(b) £ _____ [2]

- 11 (a) Claudia is an ice skater.
When she makes a jump, she rotates through $1\frac{1}{2}$ turns.**

How many degrees is this?

(a) _____ ° [2]

- (b) Matt is a snow boarder.
When he makes a jump, he rotates through 1260° .**

How many turns is this?

(b) _____ [2]

- 12 880 people were asked where they went on their summer holidays.
These are the results.

UK	Europe	Rest of the world	Did not go on holiday
220	450	143	67

- (a) Work out the percentage of the people in the survey who replied

- (i) UK,

(a)(i) _____ % [1]

- (ii) Rest of the world.

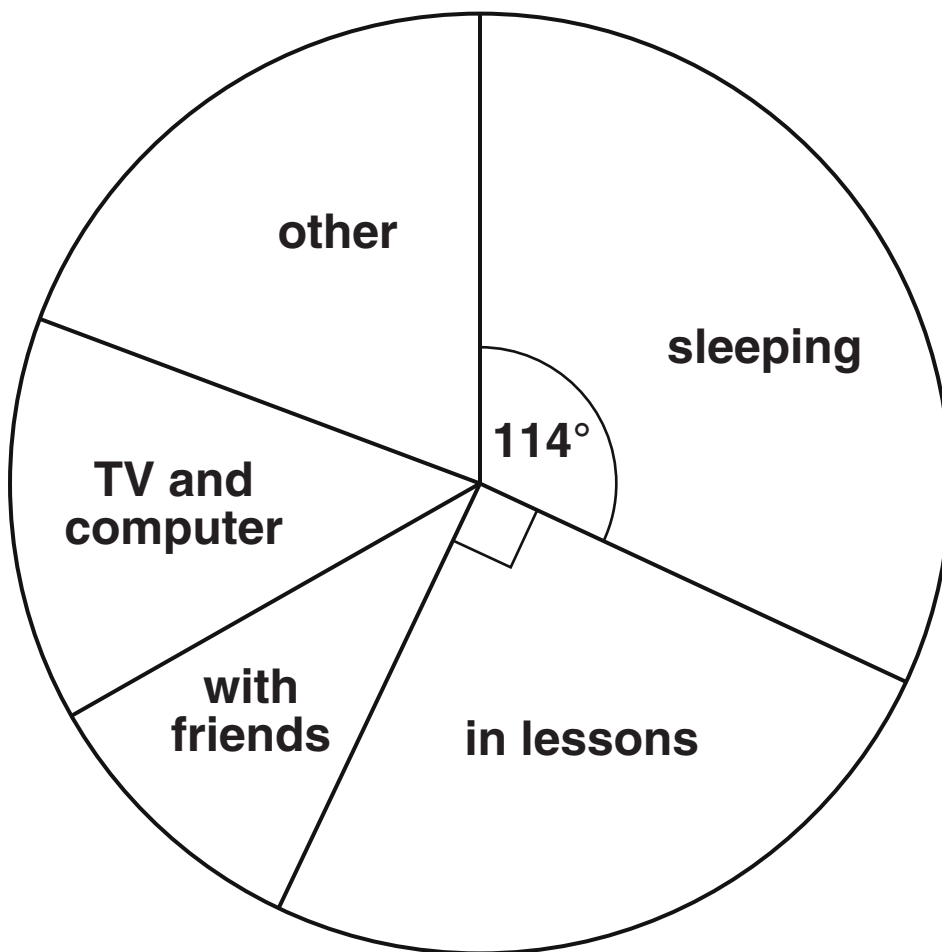
(ii) _____ % [2]

(b) 450 people went to Europe. Of these, 46% went to Spain.

How many people went to Spain?

(b) _____ [2]

13 This pie chart shows how Ivan spent the 24 hours of a day.



(a) How many hours did Ivan spend in lessons?

(a) _____ [2]

(b) (i) What fraction of the day did Ivan spend sleeping?

(b)(i) _____ [1]

(ii) How long did he spend sleeping?

(ii) _____ [2]

14 In a charity raffle 425 blue and 372 yellow tickets have been sold.

All the tickets sold are put into a tub.

The mayor draws a ticket from the tub for the first prize without looking.

(a) What is the probability that the ticket drawn for the first prize is blue?

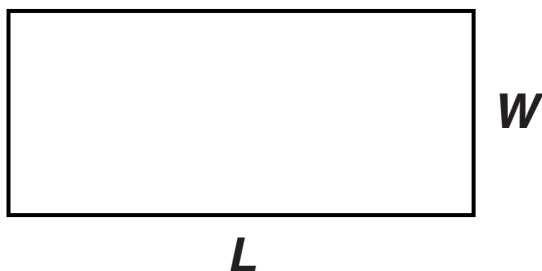
(a) _____ [2]

(b) Rhian has bought 5 tickets.

What is the probability that Rhian wins the first prize?

(b) _____ [1]

- 15 (a) (i) Explain why the formula for the perimeter, P , of a rectangle of length L and width W is $P = 2L + 2W$.



_____ [1]

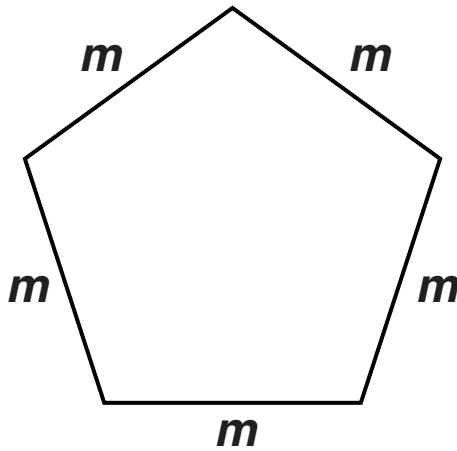
- (ii) A rectangle has a perimeter of 23 cm.
The length of the rectangle is 8 cm.

Work out the width of the rectangle.

(a)(ii) _____ cm [3]

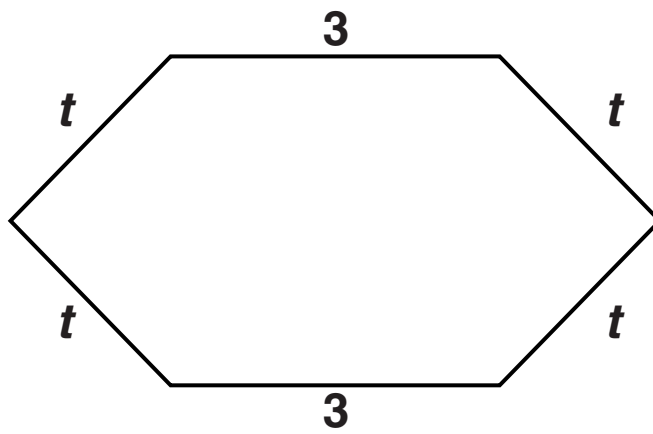
- (b) Write down an expression for the perimeter of each of these shapes.
Write each answer as simply as possible.

(i)



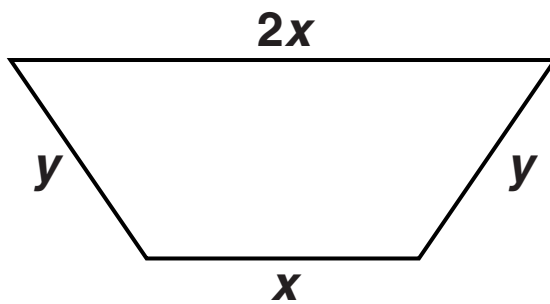
(b)(i) _____ [1]

(ii)



(ii) _____ [1]

(iii)



(iii) _____ [1]

16 FOR THE SEQUENCES IN THIS QUESTION, EACH NUMBER IS THE SUM OF THE TWO PREVIOUS NUMBERS.

Here is an example.

2	5	7	12	19
		$= 2 + 5$	$= 5 + 7$	$= 7 + 12$

(a) (i) Write the next number of this sequence in the box.

2	13	15	28	
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[1]

(ii) Complete the first five terms of this sequence.

		10		27
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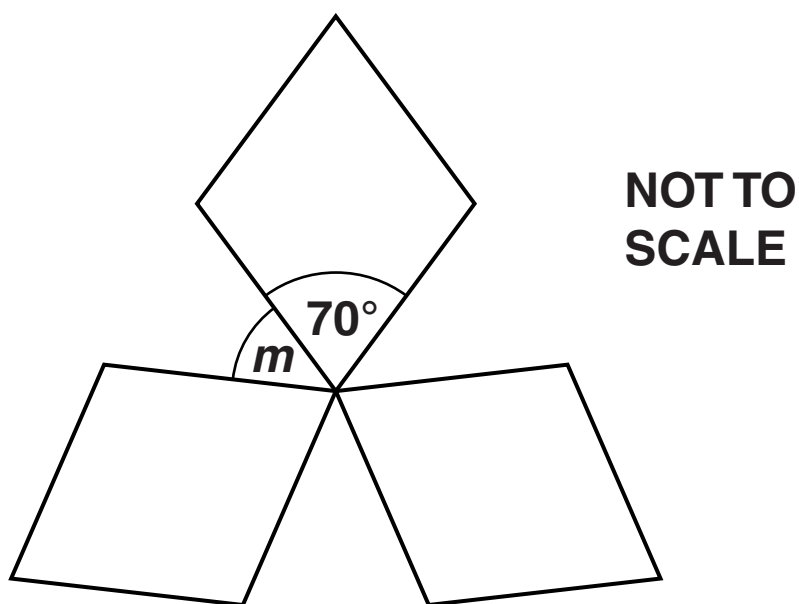
[3]

(b) Complete the first five terms of this sequence with simplified algebraic expressions.

n	3	$n + 3$		
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[2]

17 This pattern has rotation symmetry of order 3.



Work out the size of angle m .

_____° [3]

- 18 Josh raised £650 for charity.
He divided the amount between two charities in the
ratio 7 : 1.**

How much did each charity receive?

£ _____

£ _____ [2]

- 19 Calculate.**

(a) $\frac{34.7}{6.97 + 7.68}$

Give your answer correct to 1 decimal place.

(a) _____ [2]

(b) $\sqrt{3.6^2 + 2.25}$

(b) _____ [2]

20 Here are details of the costs of making one pair of jeans.

- **1.75 m of denim at £4.20 per metre**
- **Labour £2**
- **Buttons etc 85p.**

The jeans are sold for £40.

Express the profit as a percentage of the SELLING price.

_____ % **[4]**

21 Angie draws a quadrilateral with angles x° , x° , 135° and $3x^\circ$.

Work out the value of x .

_____ **[4]**

22 (a)

The front legs of a giraffe are always longer than the back legs.

Which one of these diagrams shows this information?

Diagram A

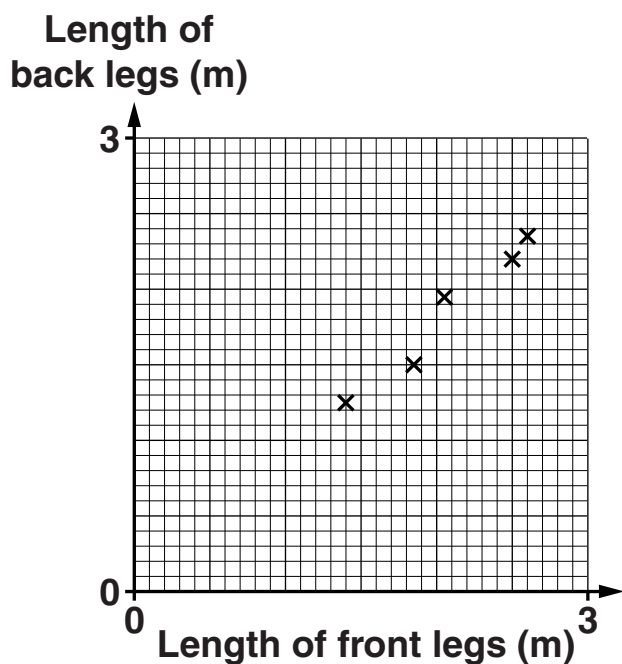


Diagram B

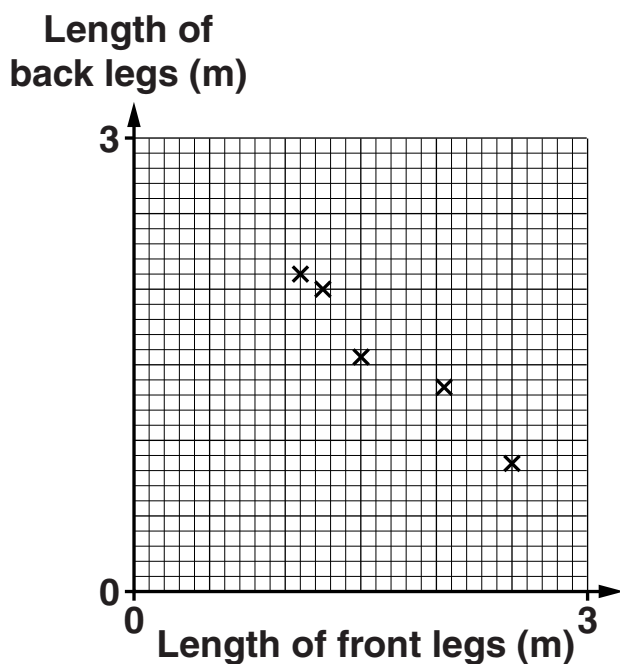


Diagram C

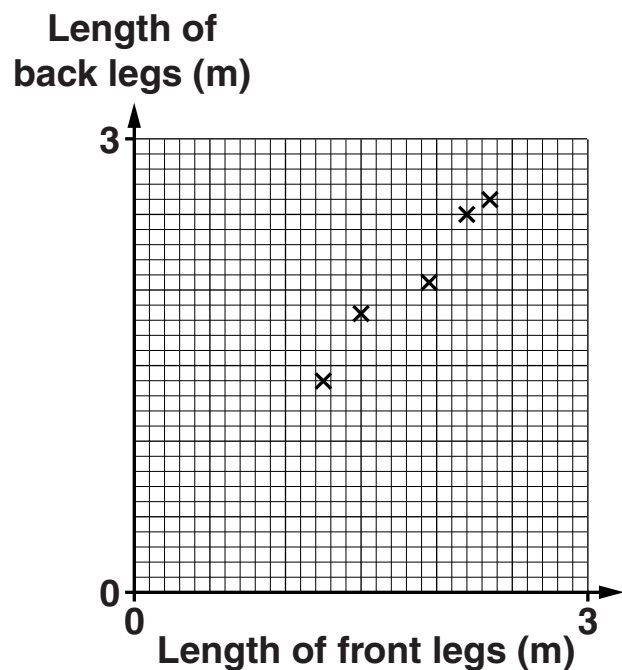
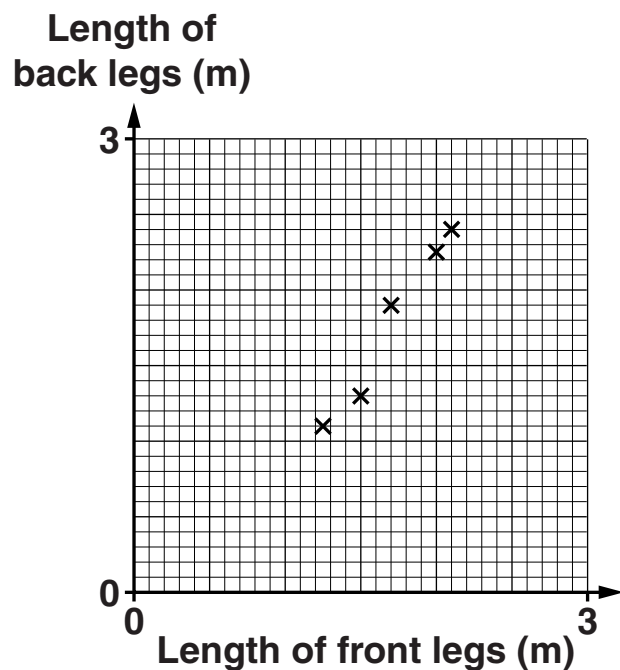


Diagram D



(a) Diagram _____ [1]

(b) The table summarises the times, in minutes, that giraffes in a herd slept during 24 hours.

Time (t minutes)	Frequency
$0 < t \leq 20$	1
$20 < t \leq 40$	4
$40 < t \leq 60$	10
$60 < t \leq 80$	12
$80 < t \leq 100$	3
$100 < t \leq 120$	2

(i) Write down the modal class interval for the time a giraffe in this herd slept.

(b)(i) _____ minutes [1]

- (ii) Work out an estimate of the mean time that a giraffe in this herd slept in 24 hours.**

(ii) _____ minutes [4]

- (c) It is known that none of these giraffes slept for less than 15 minutes.**

What effect does this fact have on

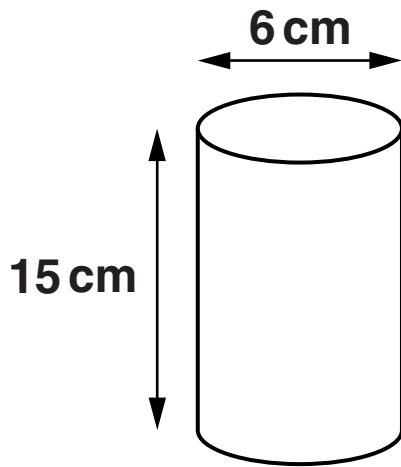
- (i) the modal class,**

_____ **[1]**

- (ii) the mean?**

_____ **[1]**

- 23 A drinking glass is a cylinder.**
The interior dimensions of the glass are as shown.



- (a) Work out the volume of liquid needed to fill the glass.**

(a) _____ cm³ [3]

- (b) Is it possible to pour the entire contents of a $\frac{1}{2}$ litre bottle of water into this glass?**
Show how you decide.

[1]

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