OCR
RECOGNISING ACHIEVEMENT

F

GENERAL CERTIFICATE OF SECONDARY EDUCATION

MATHEMATICS B

J567/02

Paper 2 (Foundation Tier)

Candidates answer on the Question Paper

OCR Supplied Materials:
None

Other Materials Required:
- Geometrical instruments
- Tracing paper (optional)
- Scientific or graphical calculator

SPECIMEN

Duration: 1 hour 30 minutes

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use 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.
- Your answers should be supported with appropriate 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.

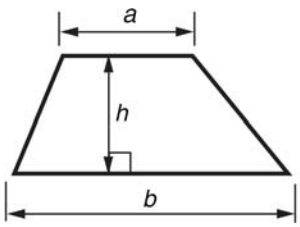
INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [ ] at the end of each question or part question.
- You are permitted to use a calculator for this paper.
- Use the π button on your calculator or take π to be 3·142 unless the question says otherwise.
- Your Quality of Written Communication is assessed in questions marked with an asterisk (*).
- The total number of marks for this paper is **100**.
- This document consists of **24** pages. Any blank pages are indicated.

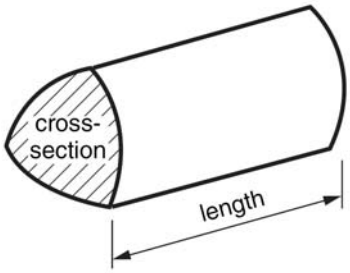
You are permitted to use a calculator for this paper.

Formulae Sheet: Foundation Tier

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



Volume of prism = (area of cross-section) × length



PLEASE DO NOT WRITE ON THIS PAGE

1 Complete.

(a) 197 + _____ = 320 **[1]**

(b) 32 × _____ = 3200 **[1]**

(c) 48% of 2400 = _____ **[1]**

2 Fill in the missing number and complete the rule for each number pattern below.

Number pattern	Rule
34 29 24 19 ____	subtract _____
48 24 ____ 6 3	_____

[4]

3 Aleksandra runs an activity camp for children.

(a) The camp is open from 8:00 am until 5:30 pm each day.

How long is the camp open each day?

(a) _____ hours _____ minutes **[1]**

(b) Aleksandra uses this rule to work out how many adult helpers she needs.

Number of children ÷ 8

How many adult helpers does she need for 40 children?

(b) _____ **[1]**

(c) Here are the charges for the activity camp.

Monday to Friday	
Half day	£12·50
Full day	£25·00
Full week (advance payment)	£108·00

How much money do you save by paying for a full week in advance instead of 5 separate days?

(c) £_____ **[3]**

(d) One day the children have a choice of activities.

Morning	Afternoon
Football (F) Cake decorating (C) T-shirt printing (T)	Swimming (S) Video making (V)

Each child has to choose a morning activity and an afternoon activity.

(i) Complete the table below to show all the possible choices.

Morning	Afternoon
F	S

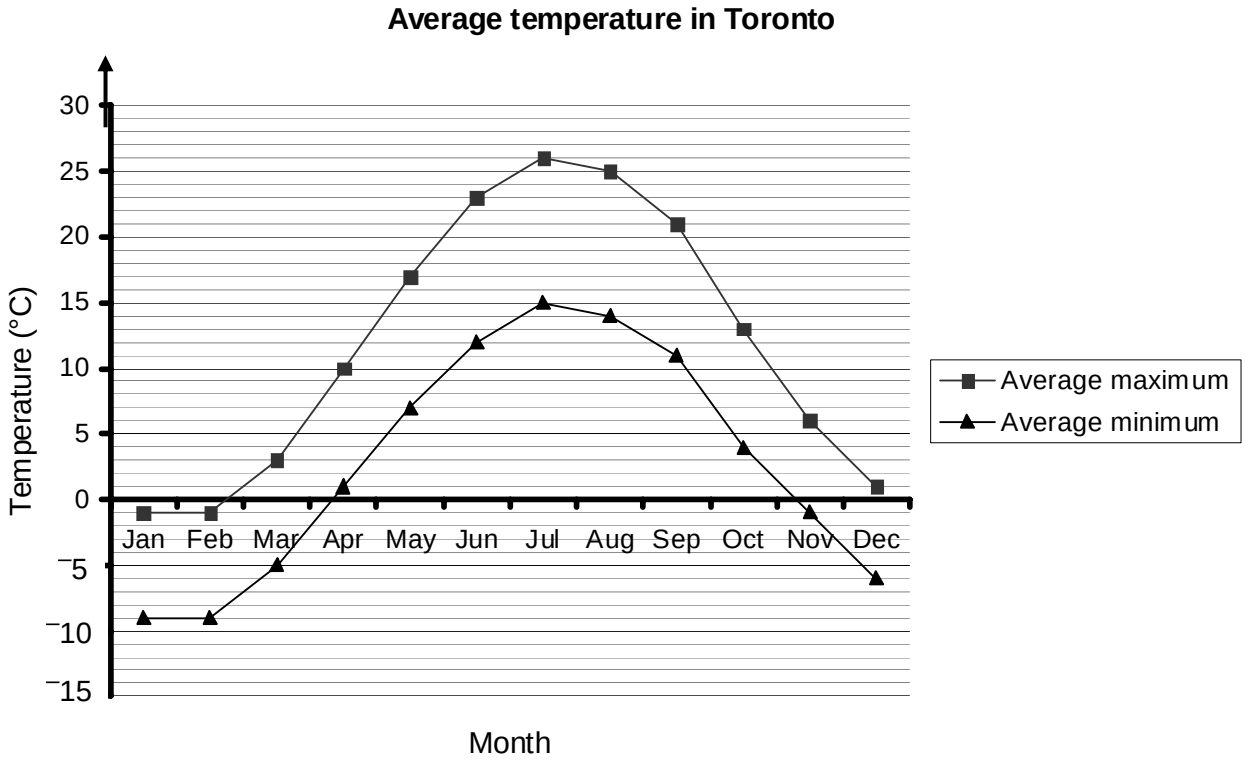
[2]

(ii) Mihal picks his activities at random.

What is the probability that he chooses T-shirt printing and swimming?

(d)(ii) _____ **[1]**

4 **(a)** The graph shows the average maximum and minimum monthly temperatures in Toronto.



(i) What is the average maximum temperature in May?

(a)(i) _____ °C **[1]**

(ii) Which month has the highest average maximum temperature?

(ii) _____ **[1]**

(iii) For how many months is the average minimum temperature below 0°C?

(iii) _____ **[1]**

(iv) The highest ever temperature in January was 14°C.

How many degrees warmer than the average maximum temperature for January is this?

(iv) _____ °C **[2]**

(b) In 2006 the population of Toronto was 2 631 725.

Complete this sentence.

In 2006, the population of Toronto was _____ to the nearest million. **[1]**

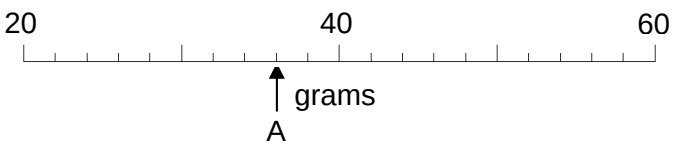
(c) The time in Toronto is 5 hours behind the time in London.

What time is it in Toronto when it is 2:30 pm in London?

(c) _____ **[1]**

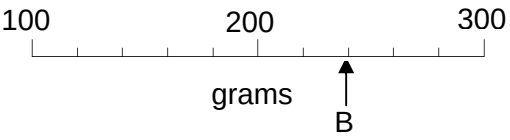
5 **(a)** What number does each arrow point to?

(i)



(a)(i) _____g **[1]**

(ii)



(ii) _____g **[1]**

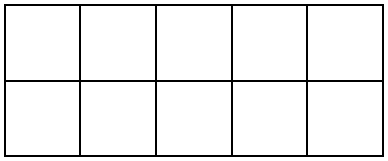
(b) Write these lengths in order, starting with the shortest.

20 cm 20 m 20 mm 0·2 cm 200 cm

_____ _____ _____ _____ _____ **[2]**

shortest

6 **(a)** Shade $\frac{2}{5}$ of this shape.



[1]

(b) Work out $\frac{3}{7}$ of 28.

(b) _____ **[2]**

7 **(a)** Simplify.

(i) $2b + 3b$

(a)(i) _____ **[1]**

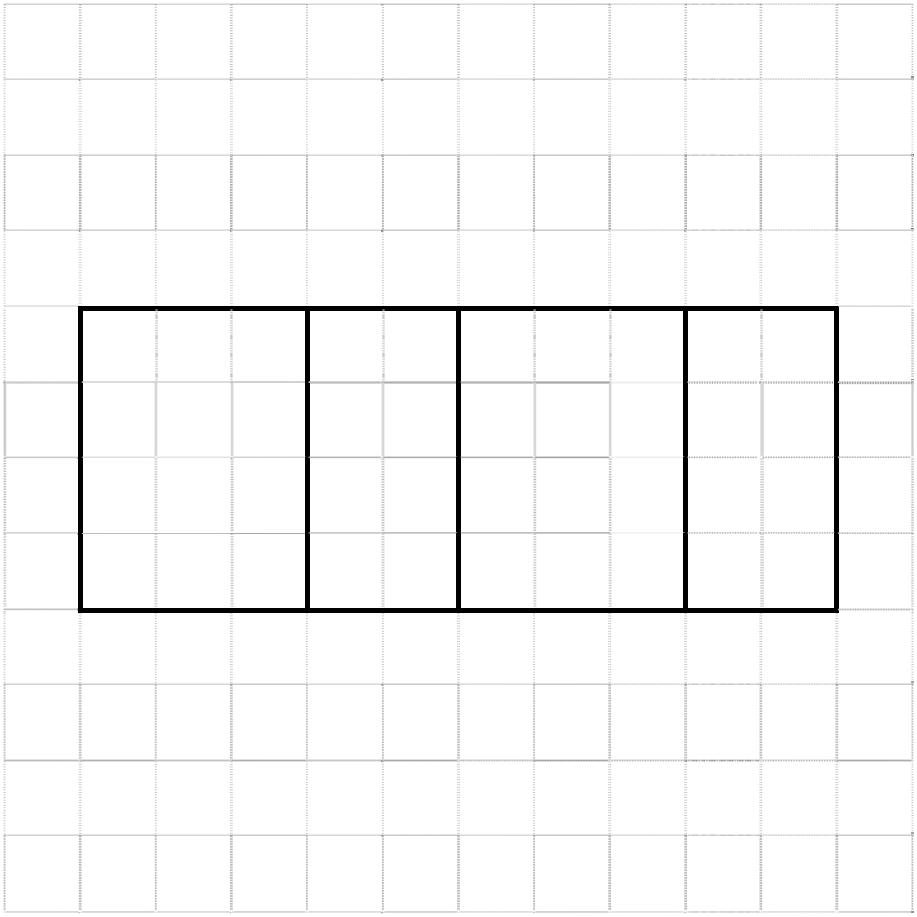
(ii) $4c + 5d + c - 3d$

(ii) _____ **[2]**

(b) Use the formula $P = 3x + 4y$ to find P when $x = 5$ and $y = 2$.

(b) _____ **[2]**

8 This diagram shows part of a net of a cuboid drawn on a centimetre grid.



(a) Complete the net of the cuboid. **[2]**

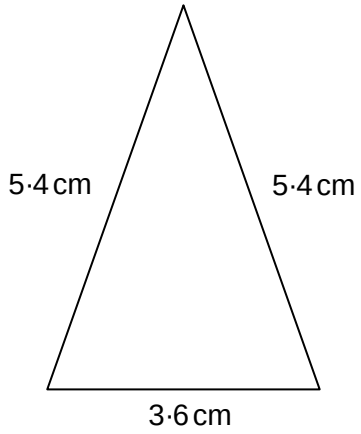
(b) The net is folded to make the cuboid.

Complete the following.

The cuboid measures _____ cm by _____ cm by _____cm. **[1]**

9 **(a)** What type of triangle is this?

Ring the correct answer.



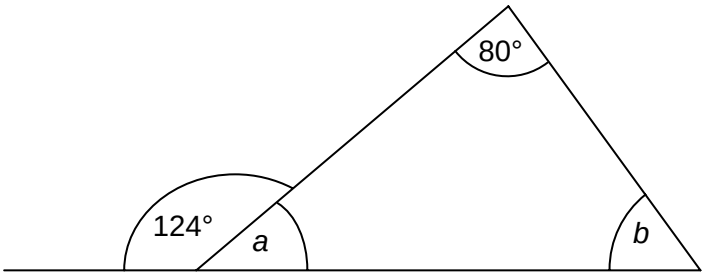
equilateral scalene isosceles

[1]

(b) Calculate the perimeter of the triangle.

(b) _____ cm **[2]**

10



Not to scale

Work out angles *a* and *b*.
Give reasons for your answers.

a = _____° because _____

_____ **[2]**

b = _____° because _____

_____ **[2]**

11 Work out.

(a) 35% of £180

(a) £ _____ **[2]**

(b) $\dfrac{43{\cdot}27 + 16{\cdot}89}{1{\cdot}74}$

Give your answer correct to 2 decimal places.

(b) _____ **[2]**

12* Mrs Crookes draws a shape.
Ravi says it is a parallelogram.
Sam says it is a rectangle.

Explain why they could both be correct.

_____

_____

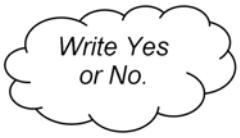
_____

_____ **[3]**

13 (a) A recipe for milkshake uses $\frac{1}{4}$ litre of milk per person.

Asim is making milkshake for 6 people.
He has a 2 litre carton of milk.

Does he have enough milk?
Explain your answer.

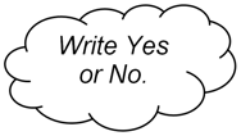


_____ because _____

_____ **[2]**

(b) Every half term, Hillcrest School sends a letter to a student's home if a student is late on more than 10% of days.
One half term, Asim was late on 3 out of the 25 days.

Will the school send a letter to Asim's home?
Give a reason for your answer.

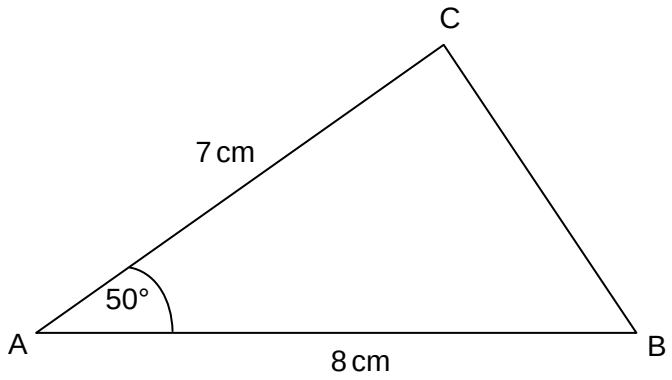


_____ because _____

_____ **[2]**

13

14



Not to scale

(a) Draw accurately triangle ABC.
The side AB has been drawn for you.

A _____ B

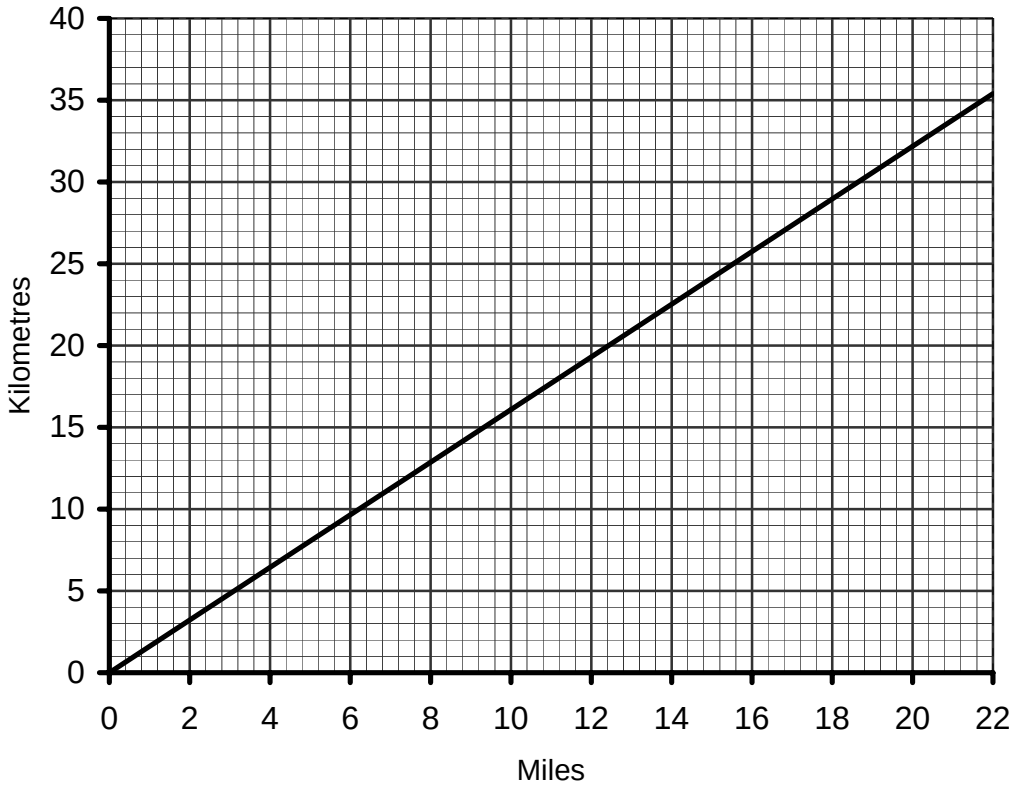
[2]

(b) Measure the length of side BC.

(b) _____ cm **[1]**

15 Here is a conversion graph between miles and kilometres.

Conversion graph between miles and kilometres



Ashia and Mel are in training for a marathon.
One week Ashia runs for a total of 39 miles.
Mel runs for a total of 68 kilometres.

Who has run further this week and by what distance?

_____ ran further by _____ **[4]**

16 Donna is doing a survey about the local library.

(a) Here is one of her questions.

> How many books do you borrow from the library in a year?

Do you think this is a good question?
Explain your answer.

_____ because _____ **[1]**

(b) Here is another of her questions.

> Do you agree that the library is a good place to do your revision?
>
> Yes ☐ No ☐

Write a better version of this question.

_____

_____

_____

_____ **[1]**

(c) Donna stands inside the library on a Thursday afternoon to do her survey.

Explain why this is not a good idea.

_____

_____ **[1]**

17 Here is the information panel in Adele's car at the end of a journey.

Journey Time: 3 hours 45 minutes Average Speed: 77 km/h

(a) **Estimate** the distance, in kilometres, that she has travelled.
Show how you obtained your estimate.

_____ km **[2]**

(b) **Calculate** the distance she has travelled.

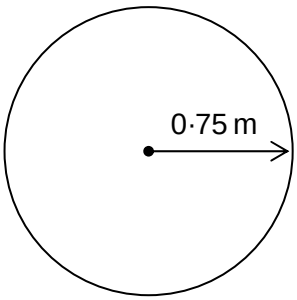
(b) _____ km **[2]**

18* Solve.

$6x - 10 = 2x + 8$

_____ **[3]**

19 Kate has a pond in her garden.
The surface is a circle with radius 0·75 m.



Kate wants to keep fish in the pond.
She finds this information on the internet.

> Total length of all the fish should not be more than 5 cm for each 0·1 m^2 of the pond's surface area.

The fish she chooses are each 8 cm long.

What is the maximum number of these fish that Kate can buy for her pond?

_____ **[6]**

20 (a) In Year 9 at Mowden School there are 140 girls and 84 boys.

Write the ratio of girls to boys in its simplest terms.

(a) _____ **[2]**

(b) In Year 10 the ratio of girls to boys is 3 : 2.
There are 240 students in this year group.

How many boys are there?

(b) _____ **[2]**

21 These are the weekly wages, in pounds (£), paid to 11 workers.

275 160 842 275 420 359 315 275 740 280 195

Jermaine says the average wage is £280.
Jane says the average wage is £376.

Show how they can both be correct.

[5]

22 The number 371 is equal to the sum of the cubes of its digits.

$$371 = 3^3 + 7^3 + 1^3 = 27 + 343 + 1 = 371$$

Find which of the following numbers have the same property.

237 153 407

_____ **[3]**

23 Ray and two friends book their summer holiday.
The three of them will share an apartment.
Information about the cost of their holiday is shown below.

	Price per person					
	Departures on or between					
	7 July - 20 July		21 July - 24 August		25 August - 31 August	
	7 nights	14 nights	7 nights	14 nights	7 nights	14 nights
2 sharing	£562	£662	£610	£710	£610	£672
3 sharing	£526	£588	£571	£633	£573	£633
4 sharing	£508	£550	£552	£595	£554	£595

They book to depart on 30 July and stay for 7 nights.
They each pay a deposit of £120 when they make the booking.

Ray later pays the remaining amount for them all.

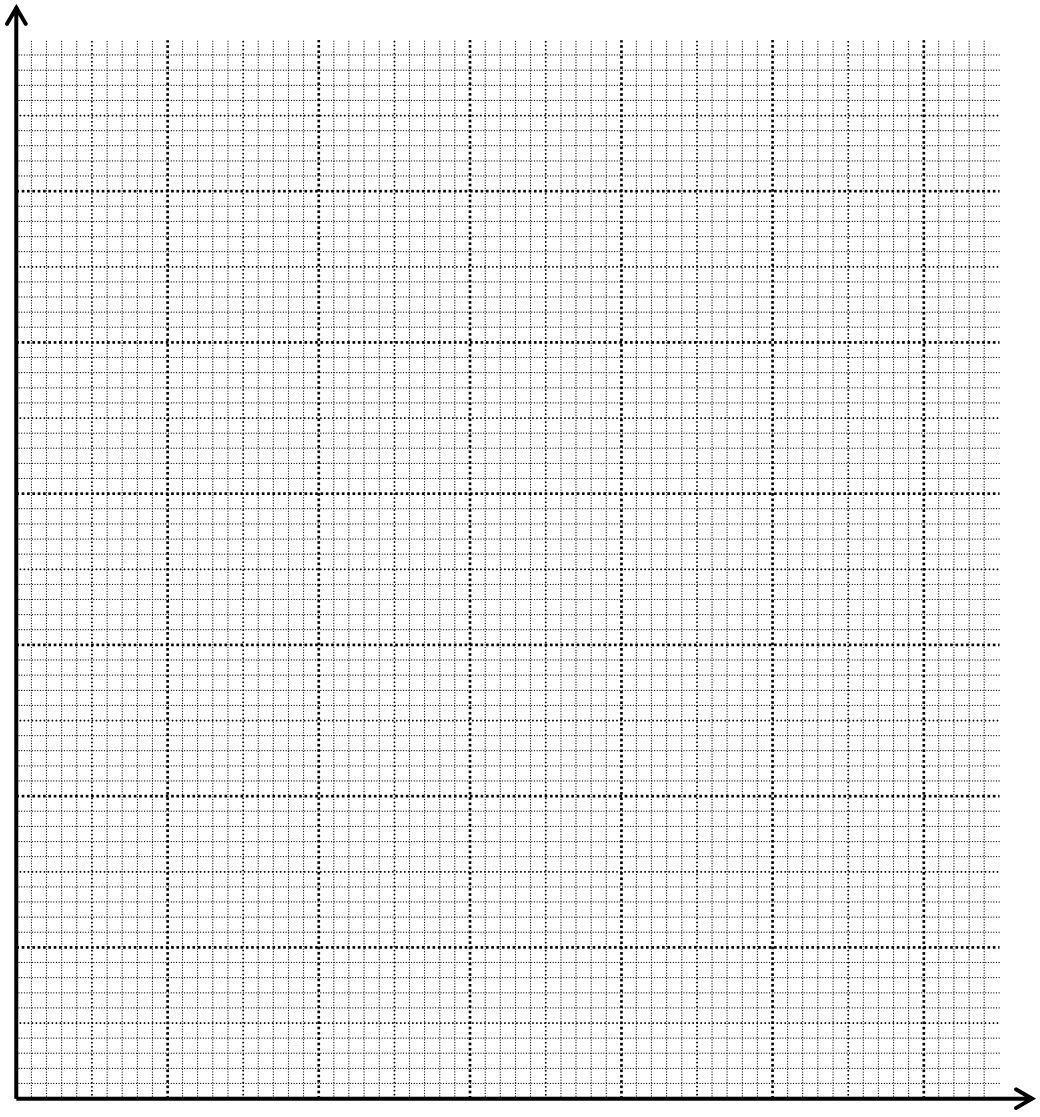
How much is this amount?

£ _____ **[2]**

24 Muttiah collects 8 leaves from his garden and measures their lengths and widths.
His results are shown in the table below.

Which of these leaves come from the same type of tree and which do not?

Leaf	A	B	C	D	E	F	G	H
Length (mm)	144	123	116	149	126	148	118	137
Width (mm)	116	76	62	79	67	50	70	81



[5]

TURN OVER FOR QUESTION 25

25 **(a)** Factorise.

$15b + 10$

(a) _____ **[1]**

(b) Multiply out and simplify.

$3(d - 2) + 2(d + 1)$

(b) _____ **[2]**

Oxford Cambridge and RSA Examinations

General Certificate of Secondary Education

MATHEMATICS B J567/02

Paper 2 (Foundation Tier)

Specimen Mark Scheme

The maximum mark for this Paper is **100**.

This document consists of **6** printed pages and **2** blank pages.

SP (SLM) T12103

1	**(a)** 123	**1**	
	(b) 100	**1**	
	(c) 1152	**1**	
2	14 [subtract] 5 12 Divide by 2 oe	**1** **1** **1** **1**	 Accept halve (or 'half')
3	**(a)** 9 [hours] 30 [minutes]	**1**	Accept 9½ hours
	(b) 5	**1**	
	(c) 17	**3**	**M1** for 25 × 5 [=125] AND **M1** for '*their* 125' – 108
	(d)(i) F S F V C S C V T S T V	**2**	All correct no repeats Clear intention of correct activities **B1** for at least 3 correct, condone repeats, extras or omissions
	(ii) $\frac{1}{6}$	**1**	ft *their* table
4	**(a)(i)** 17	**1**	
	(ii) July	**1**	
	(iii) 5	**1**	
	(iv) 15	**2**	**B1** for ⁻1 seen
	(b) 3 000 000	**1**	or 3 million
	(c) 9:30 am or 0930	**1**	
5	**(a)(i)** 36	**1**	
	(ii) 240	**1**	
	(b) 0·2 cm, 20 mm, 20 cm, 200 cm, 20 m	**2**	**B1** for longest and shortest both correct or complete reversal
6	**(a)** 4 squares shaded	**1**	
	(b) 12	**2**	**M1** for attempt at 28 ÷ 7 × 3, or 4 seen
7	**(a)(i)** 5*b*	**1**	
	(ii) 5*c* + 2*d* final answer	**2**	**M1** for 5*c* or 2*d* seen
	(b) 23	**2**	**M1** for 3 × 5 + 4 × 2 seen, or both 15 and 8 seen

8	**(a)** Two 2 cm by 3 cm rectangles correctly positioned	**2**	**B1** for at least one 2 cm by 3 cm rectangle seen
	(b) 4, 3, 2	**1**	Any order
9	**(a)** isosceles	**1**	nambi
	(b) 14·4	**2**	**M1** for 5·4 + 5·4 + 3·6 oe soi
10	56° angles on straight line [=180°] 44° angles in a triangle [=180°]	**1** **1** **1** **1**	
11	**(a)** 63	**2**	**M1** 0·35 × 180 seen, or attempt at 10% × 3 + 5% with 10% = £18
	(b) 34·57	**2**	**B1** for 34·58 or 34·574[7…] as answer or 60·16 seen
12*	A clear, concise and comprehensive answer that addresses all the major points. The answer should be coherent, contain mathematical terminology and use correct spelling, punctuation and grammar e.g. A rectangle is a parallelogram where all angles are right angles. A completely correct answer that is badly expressed **or** a slightly incorrect or incomplete answer expressed clearly and coherently. No relevant content.	**3** **2-1** **0**	For the lower mark - the answer addresses some of the major points but does not clearly connect them or contains mathematical terminology with some errors in spelling, punctuation and grammar.
13	**(a)** Yes, 1½ [oe] litres needed, or 2 litres is enough for 8 people, or 2 ÷ 6 = 0·33… and 0·33… litres is more than ¼ litre	**2**	**M1** Attempt at $\frac{1}{4} \times 6$, or 2 ÷ 6 = 0·33…
	(b) Yes, late on 12% of days, or 10% of 25 is 2·5, so 3 is more than 10%	**2**	**M1** for $\frac{12}{100}$ or 10% = 2·5 seen
14	**(a)** Angle of 50° AC 7 cm and triangle complete	**1** **1**	±2° ±2 mm
	(b) 6·4 [cm]	**1**	ft *their* triangle
15	39 miles = 62 to 63 km, or 68 km = 42 to 44 miles Mel 5 to 6 km, or 3 to 5 miles	**M2** **A1** **B1**	**B1** for attempt to use graph for relevant conversion eg 34 km or 10 miles Dependent on M2 Must see correct unit ft *their* conversion

16	**(a)** No, difficult to answer precisely	**1**	Award mark for answer implying respondents may not remember the number of books they borrowed
	(b) Reworded non-leading question	**1**	Or question with a 'don't know' option
	(c) Only asking people who use the library at that time	**1**	Accept implication that it will be a poor sample
17	**(a)** Accept any reasonable rounding leading to 280 – 320 eg 3·5 × 80 = 280, 4 × 80 = 320, 4 × 70 = 280 or $3\frac{3}{4} \times 80 = 300$	**2**	**M1** for rounding evidenced by 3·5, 4 or 80 or correct 'product' but incorrect answer
	(b) 288·75 oe or 289 or 290	**2**	**M1** 77 × *their* time, for time allow 3·75, 345, 225, 3·45
18*	Answer of 4·5 oe supported by correct and coherent algebraic notation. Each line of working must be an equation and any fractions must be written correctly. Correct answer obtained but with some errors in notation **or** minor errors in working but supported by correct and coherent algebraic notation. The answer is incorrect and there are no correct steps in any working.	**3** **2-1** **0**	For the lower mark – evidence of correctly combining like terms eg 4*x* = 18, but incorrect or no final solution produced **or** incorrect solution with some evidence of attempt to combine like terms.
19	$\pi \times 0 \cdot 75^2$ 1·767(1…) or 1·77 50 cm per m^2 implied *their* 1·767' × 50 *'their* 88(·3…) ÷ 8 11	**M1** **A1** **M1** **M1** **M1** **A1**	Accept integer answer only for final A1
20	**(a)** 5 : 3 **(b)** 96	**2** **2**	**M1** for any equivalent ratio to 5 : 3 including 140 : 84, or 3 : 5 **M1** 240 ÷ (3 + 2)
21	Mean and median calculated	**5**	**M1** attempt to add values implied by 4136 **M1 dep** *their* 4136 ÷ 11 **A1** 376 seen AND **M2** all values listed in order and median indicated or stated OR **M1** at least 10 values **listed in order**

22	8 + 27 + 343 = 378 FALSE 1 + 125 + 27 = 153 TRUE 64 + 0 + 343 = 407 TRUE	**1** **1** **1**	
23	1353 www	**2**	**M1** for 451 × 3 soi
24	B, C, D, E, G, H are from the same tree; A and F are outliers (can be implied), and evidence (see method)	**5**	Evidence : <u>Scatter Diagram</u> **M1** correct axes labelled **M2** for 7 correct points plotted (allow **M1** for 4 points correct) **M1** for identifying main cluster on diagram or in statement allow length on either axes <u>Ratios</u> **M3** for 8 correct ratios (in order: 1·24, 1·62, 1·87, 1·89, 1·88, 2·96, 1·69, 1·69) (allow **M2** for 4 correct ratios or **M1** for any attempt at ratios) **M1** for an identification of any acceptable cluster allow ratios either way round, these figures are correct to 3sf so allow figures to a greater degree of accuracy If ratio used, accept a cluster from B, G, H or C, D, E
25	**(a)** 5(3*b* + 2) **(b)** 5*d* – 4 final answer	**1** **2**	 **M1** for 3*d* – 6 +2*d* + 2 or 5*d* or ⁻4 seen

Paper Total: 100

Assessment Objectives and Functional Elements Grid

GCSE MATHEMATICS B

J567/02

Mathematics B Paper 2 (Foundation Tier)

	Topic	Context	Ref	AO1	AO2	AO3	Functional
1	Arithmetic, percentages		FIN2 FIN3 FBN7	3			
2	Sequences		FIA1	4			
3	Time, formulae, money problem, listing outcomes, probability	Activity camp	FIN10 FIA2 FIN9 FBS1		8		3
4	Interpret graph, negative numbers, rounding, time	Toronto	FIS4 FIN12 FIN1 FIN10		7		3
5	Scales, units of length		FIG1	4			
6	Fractions of…		FIN5	3			
7	Simplify expressions, formulae		FBA3 FBA2	5			
8	Net of cuboid		FBG3	3			
9	Recognise type of triangle; calculate perimeter		FIG4 FIG5	3			
10	Angle reasoning		FIG3 FBG1	4			
11	Percentage of a quantity, order of operations		FBN7 FSN6	4			
12	Properties of quadrilaterals		FBG5	3			
13	Fractions and percentages	Milkshake recipe, school attendance	FBN5 FSN2			4	4
14	Construct triangle and measure side		FSG2	3			
15	Conversion graph	Miles/km	FBA5			4	4
16	Questionnaire	Library	FSS5		3		3
17	Speed, estimation	Car journey	FBN2 FSN6 FGG2		4		4
18	Equation		FSA2	3			
19	Area of circle, compound measures	Fish pond	FSG3 FGG2			6	6
20	Ratio	School	FSN5	2	2		
21	Averages	Wages	FIS3			5	5
22	Cubes		FBN3	3			
23	Money problem	Holidays	FIN9 FIS5		2		2
24	Scatter diagram	Leaves	FGS3			5	5
25	Using brackets in algebra		FSA3	3			
	TOTALS		**80**	**50**	**26**	**24**	**39**

Paper Total: 100 marks

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