

**GENERAL CERTIFICATE OF SECONDARY EDUCATION
METHODS IN MATHEMATICS**

B391/01

Paper 1
(Foundation Tier)

Candidates answer on the Question Paper

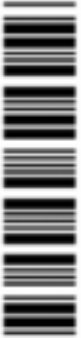
OCR Supplied Materials:
None

Other Materials Required:

- Geometrical instruments
- Tracing paper (optional)

SPECIMEN

Duration: 1 hour



Candidate Forename		Candidate Surname	
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Centre Number						Candidate Number			
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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.

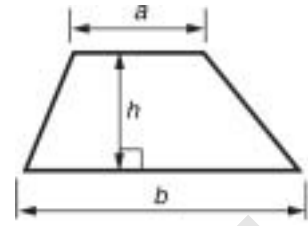
INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this paper is **60**.
- Your Quality of Written Communication is assessed in questions marked with an asterisk (*).
- This document consists of **16** pages. Any blank pages are indicated.

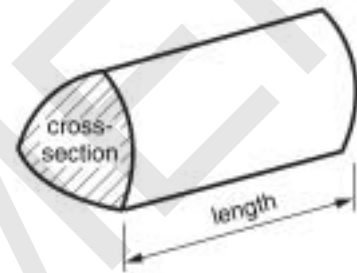
WARNING
You are **NOT** permitted to use a calculator for this paper.

Formulae Sheet: Foundation Tier

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



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



PLEASE DO NOT WRITE ON THIS PAGE

- 1 A weather station in Shropshire recorded the following minimum temperatures one week in January.

Day	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Temperature(°C)	-5	1	-3	-2	0	4	6

- (a) Which day had the lowest minimum temperature?

(a) _____ [1]

- (b) Work out the difference between the minimum temperatures on Tuesday and Friday.

(b) _____ [1]

- 2 The value of the 7 in 4723 is 700.

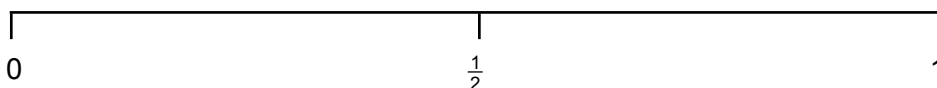
How much greater is this than the value of the 7 in 28.7?

_____ [3]

- 3 Draw arrows on the probability scale below to show the probabilities of these events happening.

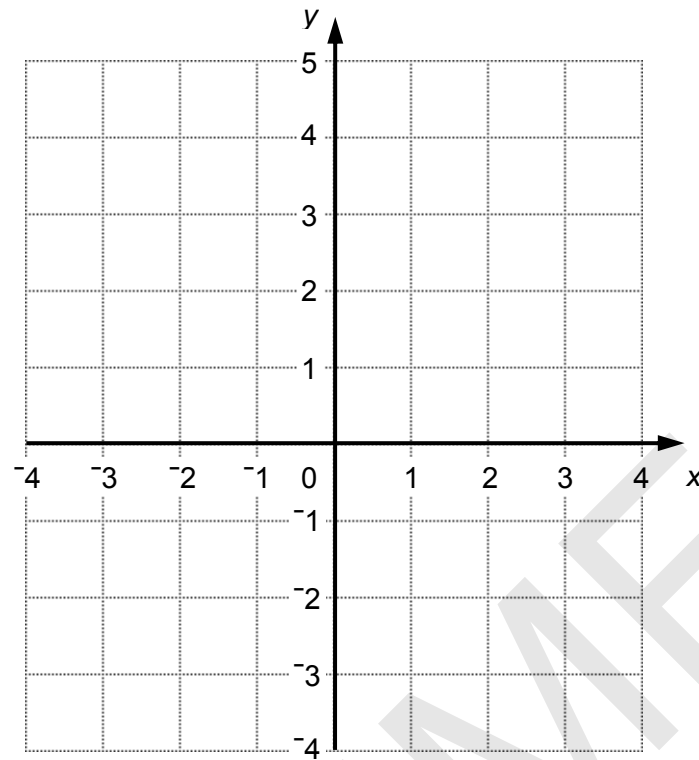
- (a) A fair coin will come down heads when it is spun. Label this arrow A.

- (b) It will rain at your home in the next month. Label this arrow B.



[2]

4 Here is a one-centimetre square grid.



(a) On the grid mark these points:

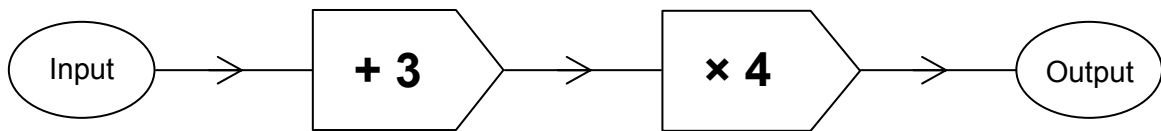
$A(3, -1)$, $B(0, 4)$, $C(-3, -1)$, $D(0, -3)$.

[2]

(b) Find the area of shape ABCD.

(b) _____ cm^2 [2]

5 (a) Here is a number machine.



(i) Calculate the output when the input is 5.

(a)(i) _____ [1]

(ii) Calculate the **input** when the output is 20.

(ii) _____ [2]

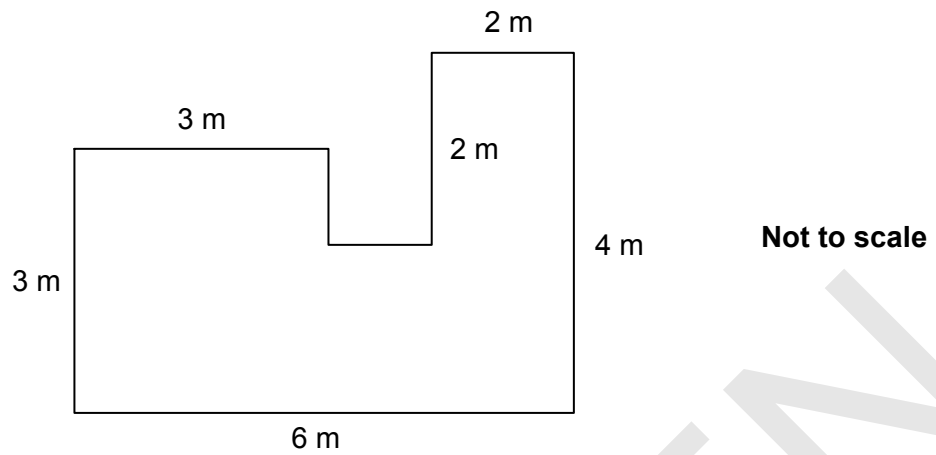
(b) Solve.

$$4x - 3 = 18$$

(b) _____ [2]

6

6 This is a plan of the plot of land on which Abbie is going to make a lawn.



(a) Work out the perimeter of the lawn.

(a) _____ [2]

(b) Abbie is going to sow grass seed to make the lawn.
Each packet of grass seed is enough to cover 4 m^2 .

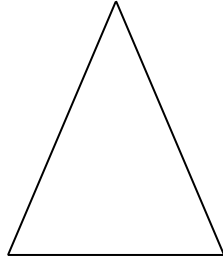
How many packets of grass seed does Abbie need?

(b) _____ [4]

7 (a) From the following list, write down the names of each of the two shapes below.

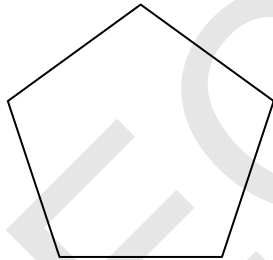
equilateral triangle	octagon	pentagon
kite	trapezium	isosceles triangle
rhombus	hexagon	parallelogram

(i)



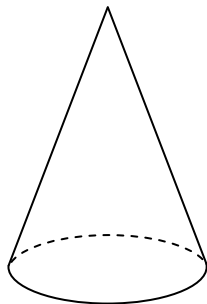
(a) _____ [1]

(ii)



(b) _____ [1]

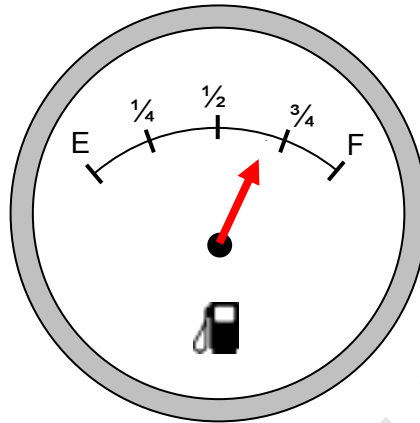
(b) Write down the name of this solid shape.



(c) _____ [1]

8 The fuel tank in Sheila's car can hold 60 litres of petrol.

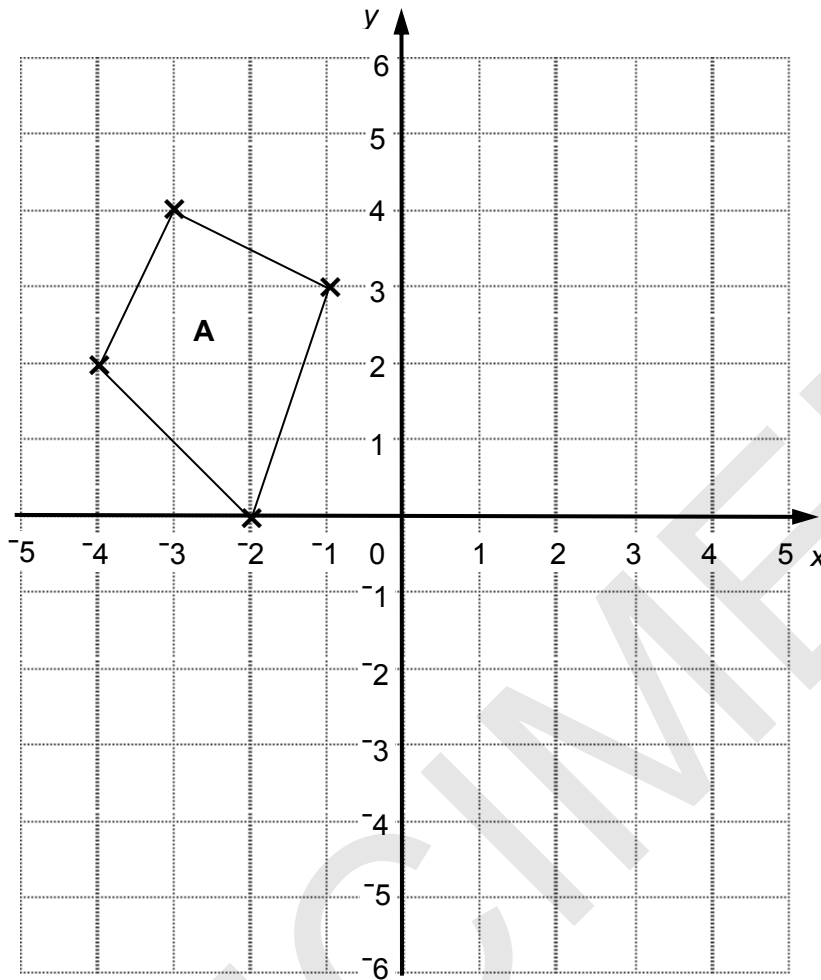
This is her fuel gauge.



Estimate how many litres of petrol she has in her petrol tank.

_____ litres [2]

9 Here is a one-centimetre grid.



(a) Draw the line $y = x$, for x from -5 to 5 , on the grid. [2]

(b) Draw the reflection of shape **A** using $y = x$ as the mirror line. [2]

(c) Which of these equations represents a line parallel to $y = x$?
Explain how you decide.

$$y = 2x$$

$$y = -x$$

$$y = 4 + x$$

$$y = 4 - x$$

_____ because _____

_____ [2]

10 (a) Ben has a plank of wood that is 2.70 metres long. From this plank he cuts one piece that is 1.40 metres long and a second piece 0.89 metres long. The rest is waste.

How much is waste?

(a) _____ m [2]

(b) Put these in order, smallest first.

$$\frac{2}{5}$$

0.3

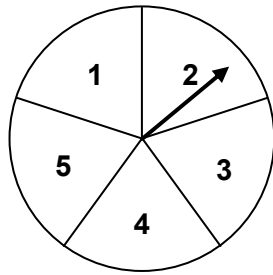
34%

0.27

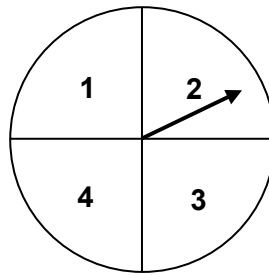
(b) _____, _____, _____, _____ [3]
smallest

11 Anya has these two fair spinners.

1st Spinner



2nd Spinner



(a) What is the probability of getting an odd number on the 1st spinner?

(a) _____ [1]

(b)* Anya spins both spinners and records the total score.
She thinks that the most likely score is 7, as it is with two dice.

Show that Anya is wrong.
You may use this table if you wish.

_____ [4]

12 Roshan, Simon and Tina are trying to estimate the probability that a student in their school is left-handed.

To do this, they select a number of students at random.

Their results are shown in this table.

	Roshan	Simon	Tina
Number of people selected	270	90	20
Number who are left-handed	30	15	8

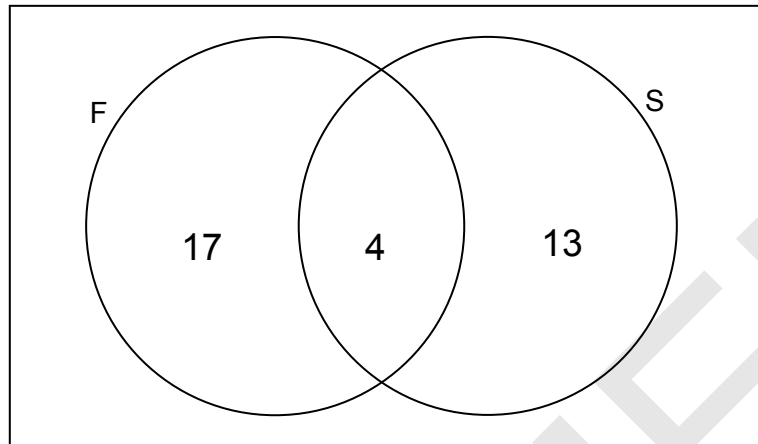
The school has 1350 students.

Use these results to help you calculate the most reliable estimate for the number of left-handed students in the school.

[4]

13 The owner of a campsite asks all 45 people staying on site to fill in a questionnaire. The questionnaire asks if they would like to play football, go swimming, do both, or do neither.

(a) Complete the Venn diagram to show how many people wanted to do neither sport.



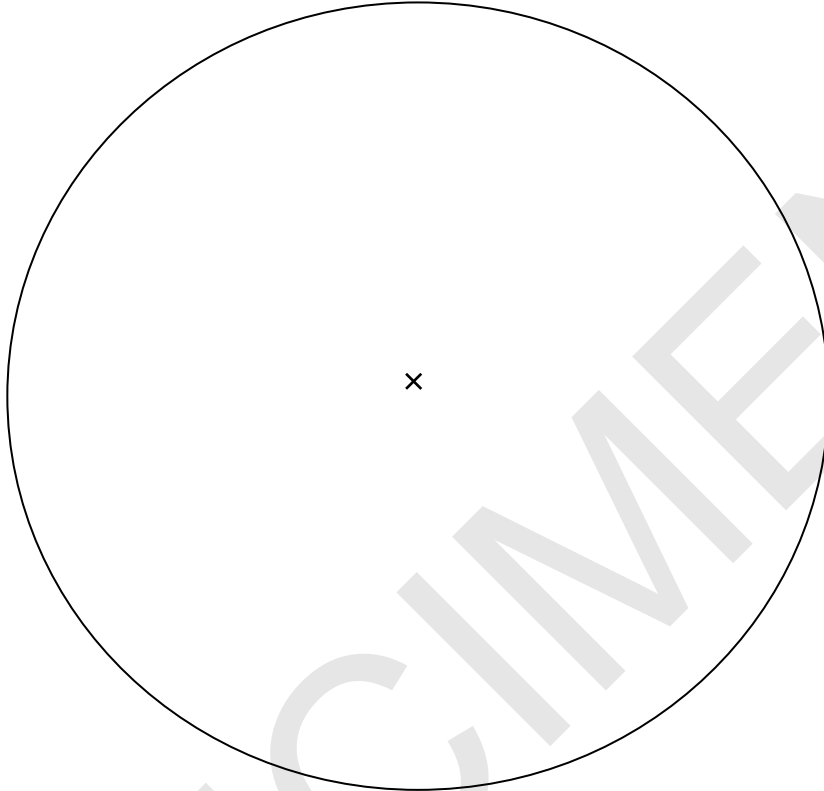
[2]

(b) What is the probability that a person, chosen at random, wanted to play football?

(b) _____ [2]

14 Barry says, "I can draw a chord in this circle that meets a tangent at an acute angle."

Show what Barry's diagram could look like.



[2]

15 Set $A = \{\text{all regular polygons}\}$, set $B = \{\text{all quadrilaterals}\}$.
The universal set, $E = \{\text{all plane shapes}\}$.

Use set notation to describe the set that contains only squares.

_____ [1]

16 Expressed as a product of its prime factors, $540 = 2 \times 2 \times 3 \times 3 \times 3 \times 5$.

(a) Express 252 as a product of its prime factors.

(a) _____ [2]

(b) Find the lowest common multiple (LCM) of 540 and 252.

(b) _____ [2]

(c) Find the smallest integer k such that $540k$ is a square number.

(c) _____ [2]

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OXFORD CAMBRIDGE AND RSA EXAMINATIONS

General Certificate of Secondary Education

METHODS IN MATHEMATICS

B391/01

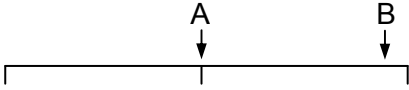
Paper 1 (Foundation)

Specimen Mark Scheme

The maximum mark for this paper is **60**.

SPECIMEN

This document consists of **4** printed pages.

1	(a)	Sun(day)	1	Do not accept S
	(b)	7	1	Accept -7
2		0.7 or $\frac{7}{10}$ seen for the 7 in 28.7 Attempt to work out $700 - 0.7$ 699.3	1 1 1	accept in words
3			2	1 each Accept B anywhere between $\frac{3}{4}$ and 1
4	(a)	One point plotted correctly Three more points plotted correctly	1 1	Condone no labels; do not accept wrong labels
	(b)	21 www	2	If wrong, allow M1 for any correct working, including attempt at counting squares
5	(a)	(i) 32	1	
		(ii) 2	2	M1 for middle stage of 5 soi.
	(b)	5.25 or $5\frac{1}{4}$ or $\frac{21}{4}$	2	M1 for $4x = 18 + 3$
6	(a)	22 (m)	2	M1 for $3 + 3 + 1 + 1 + 2 + 2 + 4 + 6$ condone 1 error or omission
	(b)	Splitting into 3 rectangles seen 19 (m ²) 5 packets	1 2 1ft	or surrounding and splitting remainder 1 for 2 correct rectangle areas Their area $\div 4$ and rounded <u>up</u>
7	(a)	(i) Isosceles triangle	1	Both words needed
		(ii) Pentagon	1	
	(b)	Cone	1	
8		39 – 43 litres	2	1 for wider range of 37 – 45
9	(a)	Correct line	2	Allow 1 mark for correct line that is too short, or for a line parallel to the correct line, or for a line through (-5, -5).
	(b)	Correct reflection (0, -2), (3, -1), (4, -3), (2, -4).	2	B1 for 1 correct point. Allow ft from their straight line. max 1 mark if line parallel to axis used.

	(c)	$y = 4 + x$ It has the same gradient.	1 1	However it is expressed.
10	(a)	0.41m	2	B1 2.29m or their 2.29m subtracted from 2.70m
	(b)	$\frac{2}{5} = 0.4$ or 40% 34% = 0.34 0.3 = 30% and 0.27 = 27% 0.27, 0.3, 34%, $\frac{2}{5}$	1 1 1	Accept other versions
11	(a)	$\frac{3}{5}$	1	
*	(b)	A correct answer eg Anya is wrong because 5 and 6 are equally the most likely outcomes, obtained with full supporting working and expressed in clear and correct language. A clear attempt to list in a systematic way the various combinations of scores on the two spinners, and their totals, with minor errors or omissions, expressed in clear and correct language. No relevant comment or calculation	3-4 1-2 0	For the lower mark – no conclusion expressed but a complete correct listing of all possible outcomes or a complete but less well expressed correct answer. For the lower mark – more than 2 errors or omissions or a less well expressed answer or a clear indication of the method employed.
12		Identify Roshan's data as most reliable 150 www	1 3	May be identified by being used Allow 3 marks for 225 from Simon or 540 from Tina. Allow M1 for use of 'their' correct fraction and M1 for multiplying 'their' fraction by 1350.
13	(a)	(i) 11 in correct place (in E , not in $F \cup S$)	1 1	
	(b)	(iii) $\frac{21}{45}$	1 1	for 21 as numerator for 45 as denominator
14		Completely correct diagram, with straight lines	2	Allow 1 mark for clear understanding of tangent or chord or acute angle, or for diagram completely correct except for wobbly lines.

15		$A \cap B$	1	Allow alternative, correct, answer.
16	(a)	$2 \times 2 \times 3 \times 3 \times 7$	2	M1 for one pair of factors seen.
	(b)	3780	2	M1 for 540×7 or 252×15 oe
	(c)	15	2	B1 for $15 \times$ square number evaluated

SPECIMEN

Assessment Objectives
GCSE Methods in Mathematics
B391/01 (Foundation)

Qn	AO1	AO2	AO3
1	1	1	
2		3	
3	2		
4	4		
5	5		
6		6	
7	3		
8			2
9	4	2	
10	3	2	
11*	1		4
12			4
13	2	2	
14	2		
15		1	
16	4		2
Total	31	17	12