F

GENERAL CERTIFICATE OF SECONDARY EDUCATION

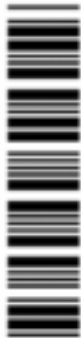**MATHEMATICS A**

Unit A (Foundation)

A501/01

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

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.
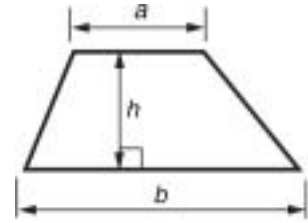• Write your answer to each question in the space provided.

INFORMATION FOR CANDIDATES

• The number of marks is given in brackets **[ ]** at the end of each question or part question.
• 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 **60**.
• This document consists of **20** pages. Any blank pages are indicated.

You are permitted to use a calculator for this paper.

OCR is an exempt Charity
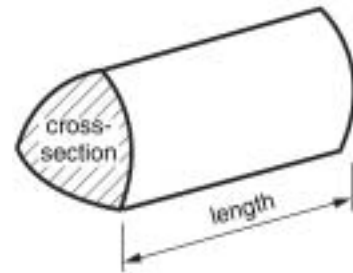SPECIMEN

Turn over
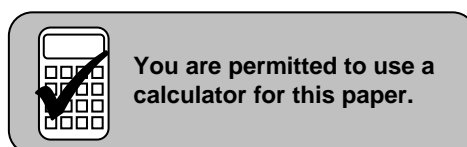
Formulae Sheet: Foundation Tier

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

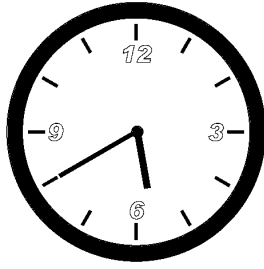**Volume of prism** = (area of cross-section)×length

PLEASE DO NOT WRITE ON THIS PAGE

1 Write down these readings.

(a)

(a) _____ **[1]**

(b)

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

(c)

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

SPECIMEN **Turn over**
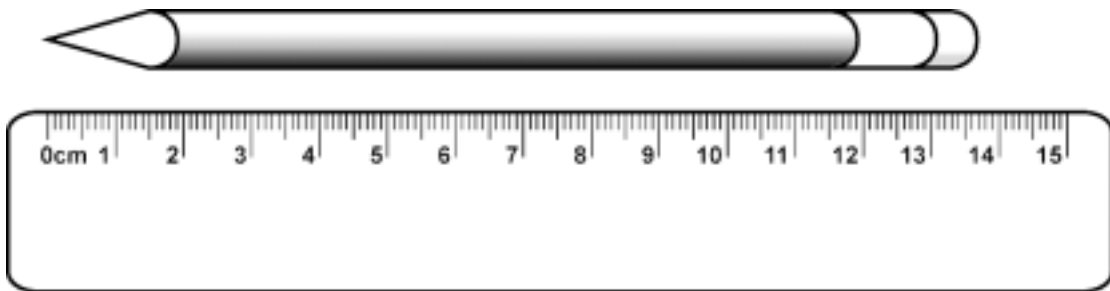
2 (a) Write down two multiples of 12.

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

(b) Write down all the factors of 10.

(b) _____ **[2]**

(c) Write down a prime number that is between 25 and 30.

(c) _____ **[1]**

3 (a) Simplify.

(i) $r + r + r + r + r$

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

(ii) $q \times q$

(ii) _____ **[1]**

(b) Write an expression for the perimeter of this hexagon.
Write your answer as simply as possible.

(b) _____ **[2]**

SPECIMEN
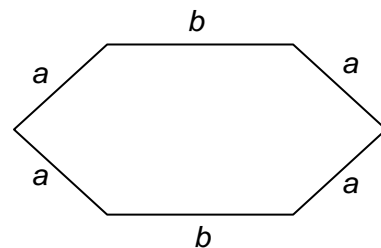
4 (a) Write the number 122 000 in words.

_____ **[1]**

(b) Write the number sixteen thousand and ten using figures.

(b) _____ **[1]**

(c) Use an arrow to indicate the number 1387 on this number line.
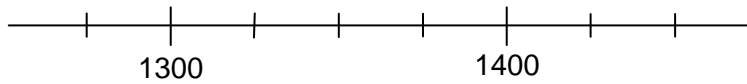
```
    |   |   |   |   |   |   |   |
   1300            1400
```
[1]

(d) Write the number 129·88 correct to 1 significant figure.

(d) _____ **[1]**

(e) Write down the next term in this sequence.

16   23   30   37   _____ **[1]**

5 Use your calculator to work these out.

(a) $\sqrt{22 \cdot 09}$

(a) _____ [1]

(b) $1 \cdot 2^3$

(b) _____ [1]

(c) $\dfrac{11 \cdot 2 - 5 \cdot 5}{1 \cdot 3}$

Give your answer correct to 1 decimal place.

(c) _____ [2]

SPECIMEN

6 Steve and Jo want to have a night out.
They can go to the cinema, the theatre or a concert.
If they go to the concert they will walk there and back.
If they go to the theatre or the cinema they will need to travel by taxi each way.

	Distance from home	Ticket price per person
Theatre	5 miles	£14
Cinema	8 miles	£7·50
Concert	Walking distance	£27·50

There are two taxi companies they can use.

	Charge per journey
Eddie's Cabs	£2·80 per mile
Hodge's Cars	£1·20 per mile plus £10

Use this information to work out which would be the cheapest night out.

[6]

7 Solve.

(a) $4x = 20$

(a) _____ **[1]**

(b) $y + 5 = 1$

(b) _____ **[1]**

(c) $3z - 11 = 19$

(c) _____ **[2]**

8 When Omar was born he was 52 centimetres long and weighed 3·2 kilograms.

Write his length in millimetres and his weight in grams.

Length _____ mm

Weight _____ g **[2]**

SPECIMEN

9

2   2   2   2   3   5   7   10   12

(a) Find the range of the data.

(a) _____ **[1]**

(b) Find the mean of the data.

(b) _____ **[3]**

 Turn over

10 Carlos is doing an investigation into how many ways he can arrange 1p and 2p stamps to pay different amounts of postage.

These are his results so far.

Amount of postage (pence)	1	2	3	4	5	6
Number of ways	1	2	3	5	8	

Here are the five different arrangements he found for 4p.

1p 1p 1p 1p

1p 1p 2p

1p 2p 1p

2p 1p 1p

2p 2p
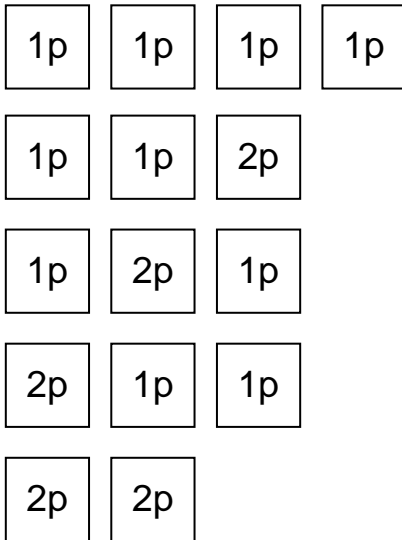
(a) Show the eight different arrangements for 5p using 1p and 2p stamps. **[2]**

(b) By continuing the pattern in the table, find the number of different arrangements for 6p.

(b) _____ **[1]**

11 Use a ruler and pair of compasses to construct a triangle with sides 5 cm, 6 cm and 8 cm. The longest side has been drawn for you.

_____

[3]

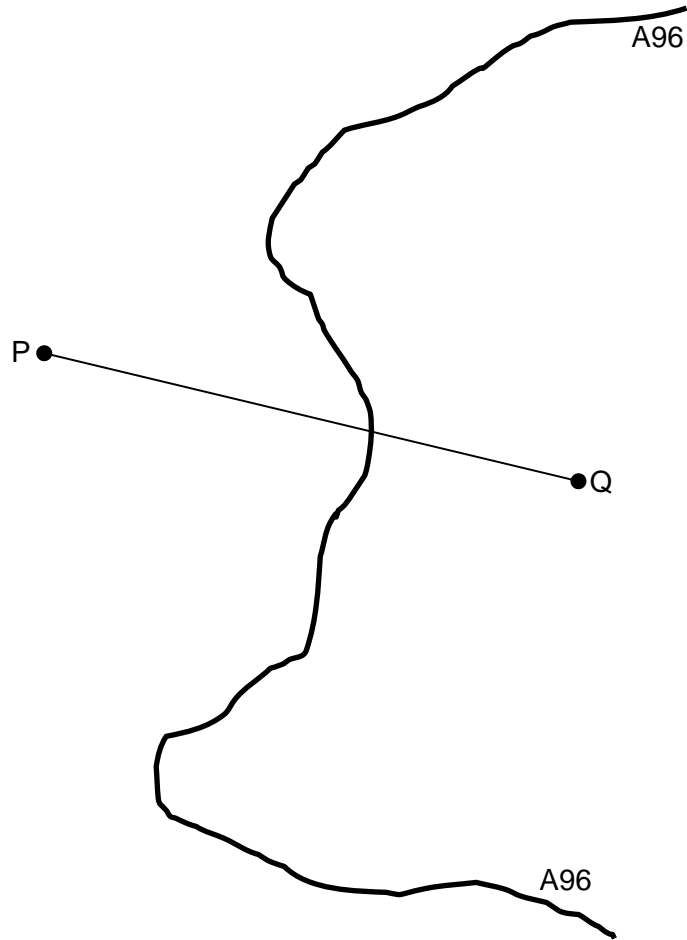**12 (a)** *Use a ruler and pair of compasses for your construction in this question.*
Leave in your construction lines.

P and Q are two mobile phone masts on either side of the A96 road.
Mobile phones pick up a signal from the closest mast.

Lizzie's car has broken down on this section of the A96.
She is told that she is receiving her mobile phone signal from mast P.

Indicate where on the road she might be.

[3]

(b) *Use a ruler and pair of compasses for your construction in this question.*
Leave in your construction lines.

A garden sprinkler is a narrow pipe 3 metres long fixed to a lawn.
The pipe has holes along its length and at both ends.
All of the lawn within 2 metres of the pipe is watered.

Show, on the scale drawing below, the region that the sprinkler waters.

Scale: 2 cm represents 1 m **[3]**

13 Rafael manages a fish and chip shop.
He wants to decide whether to use *King Edward*, *Maris Piper* or *Desiree* potatoes
to make his chips.
The three varieties of potato all cost the same amount per kilogram.

Here is some information about a typical bag of each of these varieties of potato.

(a) This table shows the distribution of weights of potatoes in a bag of 55 *King Edward* potatoes.

Weight (w g)	Frequency
$100 < w \leq 200$	16
$200 < w \leq 300$	25
$300 < w \leq 400$	9
$400 < w \leq 500$	5

Rafael says the smallest potato might weigh exactly 100 g.

Explain why he must be wrong.

_____

_____**[1]**

SPECIMEN

(b) This pie chart shows the distribution of weights of potatoes in a bag of 90 *Maris Piper* potatoes.
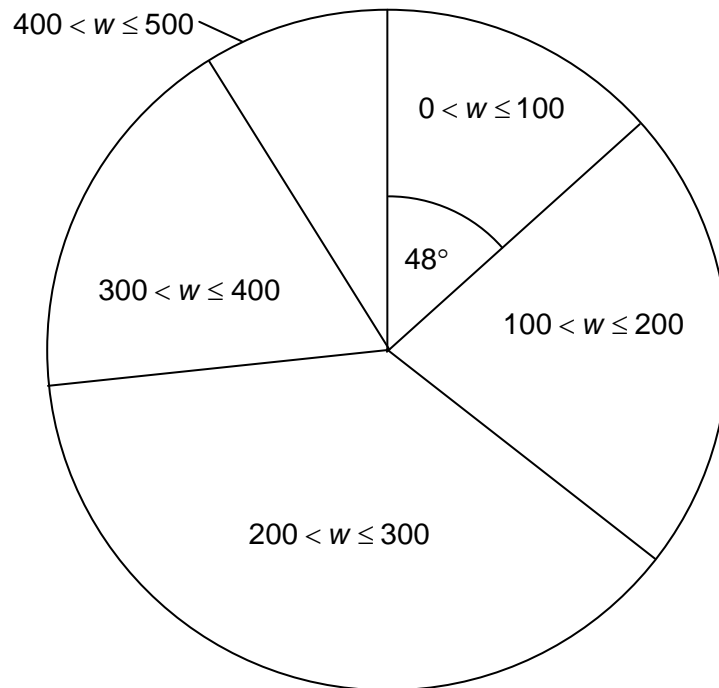
Explain how Rafael knows that there are 12 potatoes with weight up to 100 g.

_____

_____**[1]**

(c) This stem and leaf diagram shows the weights, to the nearest 10 g, of the potatoes in a bag of 30 *Desiree* potatoes.

```
1 | 2  2  3  4  6  8  8
2 | 0  1  3  7  9  9
3 | 0  2  3  3  3  4  5  5  8  9  9
4 | 3  4  4  8  8  9
```

Key   1 | 2   represents 120 g

How many of these potatoes weigh more than 400 g?

(c) _____ **[1]**

(d) Rafael needs a variety of potato with a high average weight.
He knows that small potatoes are not good for making chips.

Use the information given in this question to decide which of the three varieties of potato he should buy.

SPECIMEN

(d) _____ **[9]**

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SPECIMEN

OXFORD CAMBRIDGE AND RSA EXAMINATIONS

General Certificate of Secondary Education

MATHEMATICS A   A501/01

Unit A (Foundation)

Specimen Mark Scheme

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

This document consists of **8** printed pages.

SPECIMEN

1	(a)	5·40	**1**	Allow in words, 24 hr clock, etc
	(b)	48·3 to 48·7	**1**	Allow fractions
	(c)	13·6 to 13·8	**1**	Allow 136 to 138 mm
2	(a)	Any two multiples of 12	**1**	eg 12 and 24
	(b)	1, 2, 5, 10 only	**2**	Allow **1** for 3 correct or extras seen
	(c)	29	**1**	
3	(a)	(i) $5r$	**1**	
		(ii) q^2	**1**	
	(b)	$4a + 2b$	**2**	Allow **1** for $a + a + a + a + b + b$ (condone one term missing) or for $4a$ or $2b$
4	(a)	One hundred (and) twenty two thousand	**1**	
	(b)	16 010	**1**	
	(c)	Arrow in middle third of 4th quarter between 1300 and 1400	**1**	
	(d)	100	**1**	
	(e)	44	**1**	
5	(a)	4·7	**1**	
	(b)	1·728	**1**	
	(c)	4·4	**2**	Allow **1** for 4·3(8…)
6		Cinema, Hodge's, £54·20	**6**	*Taxi costs* Eddie's - £28 theatre, £44·80 cinema Hodge's - £32 theatre, £39·20 cinema **B2** for 3 or 4 correct or **B1** for 1 or 2 correct *Ticket costs* Theatre £28, Cinema £15, Concert £55 **B2** for 3 correct or **B1** for 1 or 2 correct *Total cost* **B2** for correct choices and total or **B1** for any correct total

7	(a)	5	1	
	(b)	⁻4	1	
	(c)	10	2	**M1** for 3z = 30
8		520, 3200	2	**1** for each
9	(a)	10	1	
	(b)	5	3	Or **M2** for (2 + 2 +…+ 12)/9 or 45/9 Or **M1** for 2 +2 +…+ 12 or 45
10	(a)	11111 1112 1121 1211 2111 122 212 221	2	Allow **1** for 6 seen (ignore repeats)
	(b)	13	1	
11		Sides within 2mm, arcs visible	3	Or **B1** for 5cm or 6cm correct length And **M1** for sensible attempt at arcs
12	(a)	Perpendicular bisector drawn with arcs (± 2°, ± 2mm). At least one correct point indicated	3	Or **M1A1** for bisector only Or **M1** if outside tolerance but arcs clear Or **SC1** if no construction and at least one correct position indicated
	(b)	Correct area indicated, scale correct	3	Or **B1** for (at least) one semicircular arc radius 4cm And **B1** for 2 straight lines at least 6cm long, 4cm from the sprinkler and parallel

13	(a)	Potatoes in this class must be **greater than** 100	1	
	(b)	48/4	1	
	(c)	6	1	
	(d)			KE(0 small), MP(12/90 small), D(0 small) Mean 255, 236·6, 303 Mode 2-300, 2-300, 3-400 (or 330) Median 2-300, 2-300, 325
			2	Consideration of small potatoes **B2**, **1**, **0**
			4	Calculation of averages **B4**, **3**, **2**, **1**, **0** (means using mid-interval and attempts to estimate a value for median within class can score up to 4 marks, medians up to 3, modes up to 2)
			1	Comparison of at least 2 averages (same type) **B1**
			2	Interpretation of results **B2**, **1**, **0**

Assessment Objectives and Functional Elements Grid

GCSE MATHEMATICS A

A501/01: Unit A (Foundation)

Qn	Topic	AO1	AO2	AO3	Functional
1	Measures		3		
2	Factors & Multiples	4			
3	Expressions	4			
4	Writing numbers	5			
5	Using a calculator	4			
6	Cost of a night out			6	6
7	Equations	4			
8	Change of units	2			
9	Mean & range	4			
10	Sequence		3		
11	Triangle construction	3			
12	Loci		6		3
13	Statistics		7	5	9
	TOTAL	30	19	11	18

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