OCR
RECOGNISING ACHIEVEMENT

F

GENERAL CERTIFICATE OF SECONDARY EDUCATION

MATHEMATICS SYLLABUS A

J512/02

Paper 2
(Foundation Tier)

Candidates answer on the question paper

OCR Supplied Materials:
None

Other Materials Required:
- Electronic calculator
- Geometrical instruments
- Tracing paper (optional)

Monday 1 June 2009
Morning

Duration: 2 hours

J512 02

OCE/10697

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

MODIFIED LANGUAGE

INSTRUCTIONS TO CANDIDATES

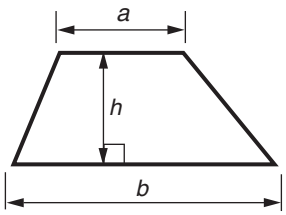
- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Show your working. 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, however additional paper may be used if necessary.

INFORMATION FOR CANDIDATES

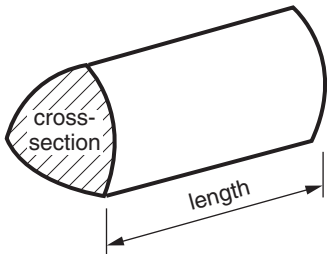
- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- You are expected to use an electronic calculator for this paper.
- Use the π button on your calculator or take π to be 3.142 unless the question says otherwise.
- The total number of marks for this paper is **100**.
- This document consists of **20** pages. Any blank pages are indicated.

Formulae Sheet: Foundation Tier

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



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



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1

27	6	11	41	5
20	58	30	16	

From the numbers above write down

(a) the smallest even number,

(a) _____ **[1]**

(b) the largest odd number,

(b) _____ **[1]**

(c) two numbers with a total of 31,

(c) _____ **[1]**

(d) two numbers with a difference of 30,

(d) _____ **[1]**

(e) a multiple of 10,

(e) _____ **[1]**

(f) a factor of 32,

(f) _____ **[1]**

(g) a prime number,

(g) _____ **[1]**

(h) a cube number.

(h) _____ **[1]**

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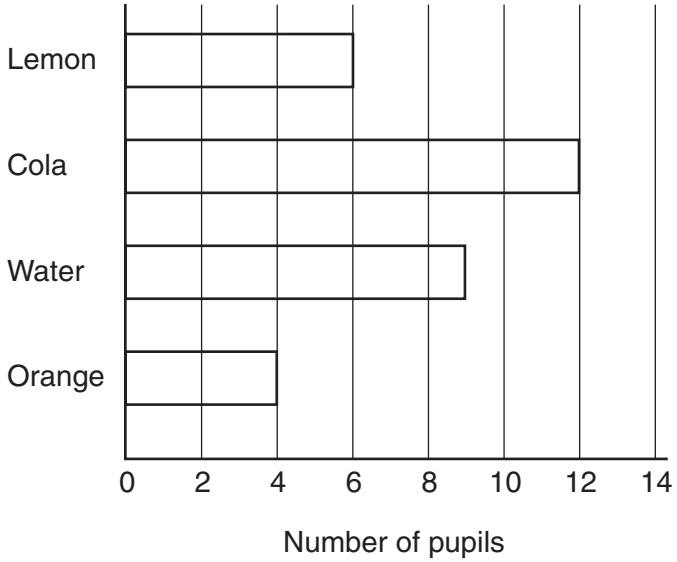
2 Pupils from class 5B went on a school trip.
They each chose a drink to take with them.
The bar chart shows their choices.



(a) (i) How many pupils chose Cola?

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

(ii) How many pupils chose Water?

(ii) _____ **[1]**

There are 33 pupils altogether in class 5B.

(b) How many pupils from class 5B did not go on the trip?

.....

.....

(b) _____ **[2]**

3 Complete the table so that the fractions, decimals and percentages in each row are equivalent to each other.

Fraction	Decimal	Percentage
$\frac{37}{100}$	0.37	37%
	0.53	53%
$\frac{3}{4}$	0.75	
		9%

[4]

4 Complete these sentences with the correct **metric** unit.
Here is an example.

A new pencil is about 16 **centimetres** long.

(a) The distance from London to Brighton is about 80 _____. **[1]**

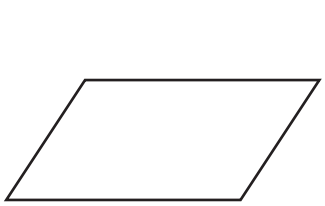
(b) The weight of a banana is about 150 _____. **[1]**

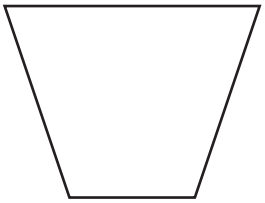
(c) The capacity of a teacup is about 200 _____. **[1]**

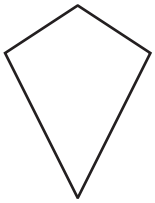
(d) The weight of a small dog is about 8 _____. **[1]**

5 **(a)** From this list pick the correct name for each shape.
Write each answer below the shape.

rhombus	**rectangle**	**kite**	**trapezium**	**square**	**parallelogram**



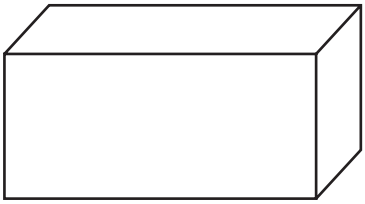


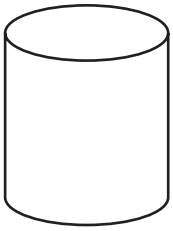


_____ _____ _____ **[3]**

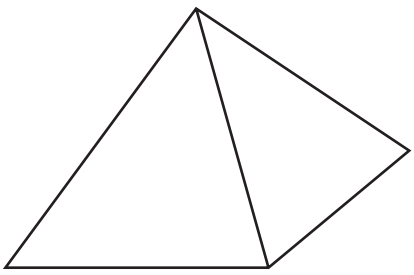
(b) From this list pick the correct name for each solid shape.
Write each answer below the shape.

cylinder	**sphere**	**cube**	**pyramid**	**cone**	**cuboid**



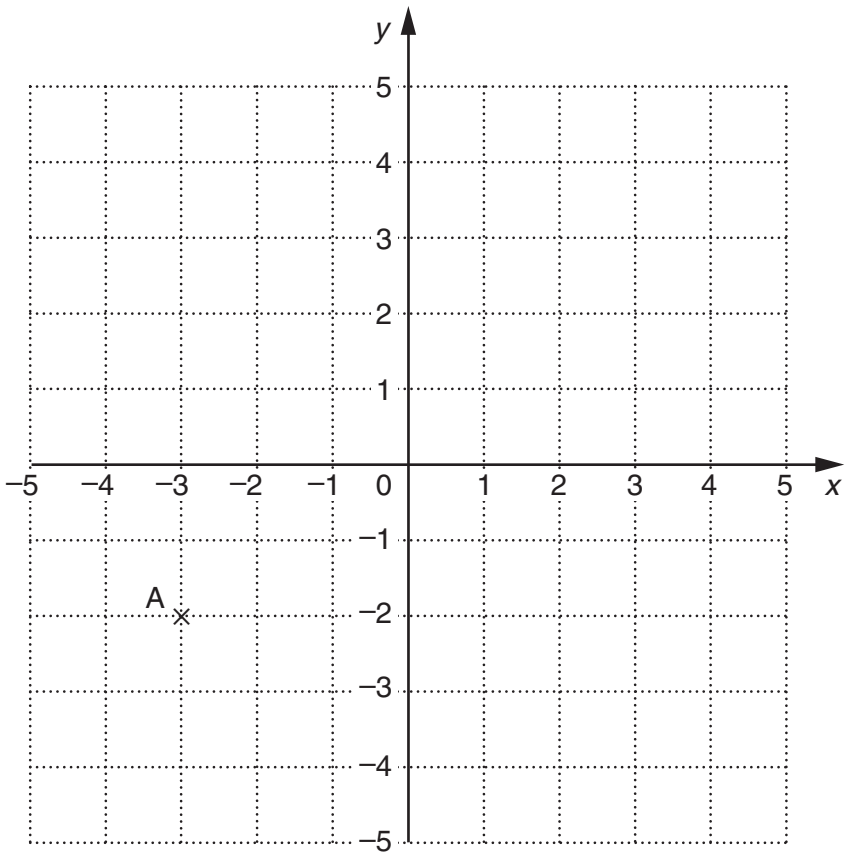


_____ _____



_____ **[3]**

6



(a) Write down the coordinates of the point A.

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

(b) Plot and label the points B(2 , 4), C(0 , 3) and D(1.5 , 2). **[3]**

7 Use your calculator to work these out.

(a) 2.11^2

(a) _____ **[1]**

(b) $\sqrt{2.89}$

(b) _____ **[1]**

(c) $\frac{3}{5}$ of 220

.....

.....

(c) _____ **[2]**

8 **(a)** Fill in the boxes in this pattern.

$2^2 = 1 + 3$

$\square = 1 + 3 + 5$

$4^2 = 1 + 3 + 5 + 7$

$5^2 = \square$

$6^2 = 1 + 3 + 5 + 7 + 9 + 11$

$\square = \square$ **[4]**

(b) Write down the next two numbers in this sequence.

22 21 18 13 _____ _____

..... **[2]**

9 Two fair dice are rolled together.

(a) Complete the table to show the possible totals.

Number on second dice

+	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3					
3	4			7	8	9
4	5			8	9	10
5	6	7		9	10	11
6	7	8	9	10	11	12

Number on first dice

[1]

(b) Find the probability that the total is 8.

.....

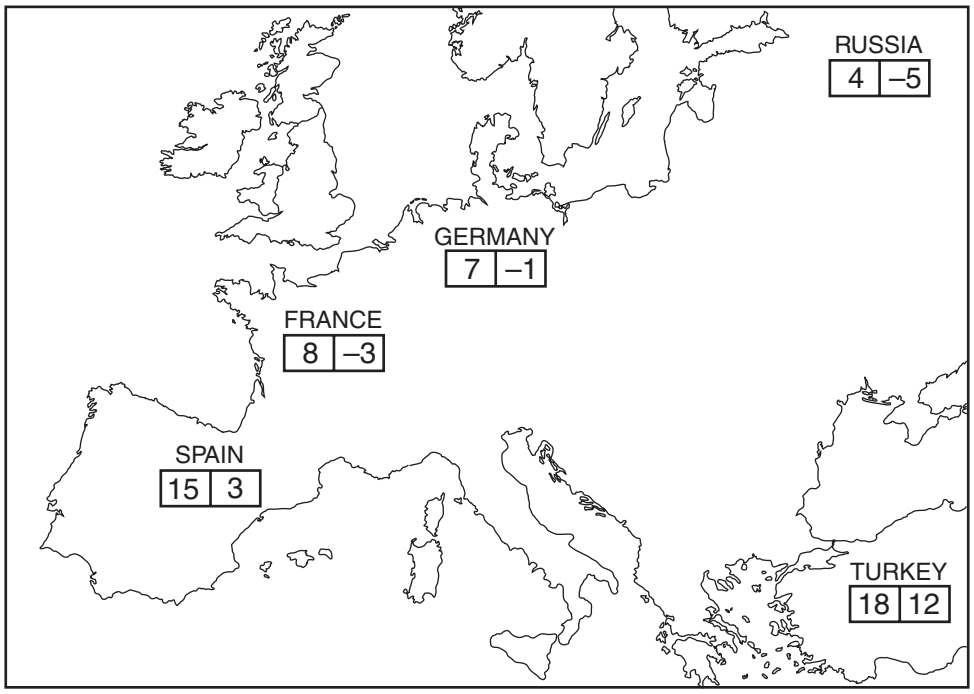
(b) _____ **[2]**

(c) Find the probability that the total is **greater than** 10.

.....

(c) _____ **[1]**

10



The numbers on the map show the highest and lowest temperatures, in °C, in 5 countries one day last year.

(a) In which country was the difference between the highest and lowest temperatures equal to 8 °C?

.....

(a) _____ **[1]**

(b) Which country had the lowest temperature overall?

(b) _____ **[1]**

(c) Which country's lowest temperature was 6 °C below Spain's lowest temperature?

(c) _____ **[1]**

(d) The next day, Russia's lowest temperature went up by 3 °C.

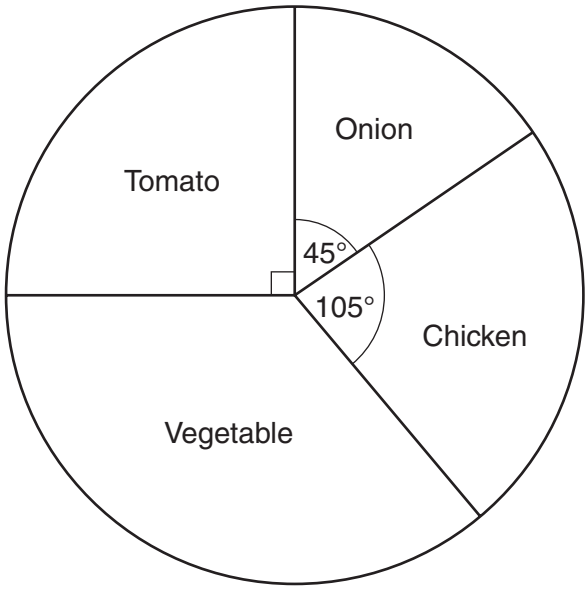
What was Russia's lowest temperature on that day?

.....

.....

(d) _____ °C **[1]**

11 24 pupils were asked to name their favourite soup.
The pie chart represents the results.



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(a) Work out the size of the angle for Vegetable.

.....

(a) _____ ° **[2]**

(b) How many of the 24 pupils chose Onion?

.....

(b) _____ **[2]**

12 Aftab has 600 marbles.
He gives a quarter of them to Anna.
He gives a third of them to Winston.

What fraction of the 600 marbles does he have left?

.....

.....

.....

.....

.....

.....

_____ **[4]**

13 **(a)** Solve.

(i) $y - 7 = 3$

.....

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

(ii) $3r = 12$

.....

(ii) _____ **[1]**

(iii) $\frac{t}{4} = 5$

.....

(iii) _____ **[1]**

(iv) $12 = 5x + 2$

.....

.....

(iv) _____ **[2]**

(b) Tony is x years old.

(i) Alan is 3 years older than Tony.

Write down an expression for Alan's age.

.....

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

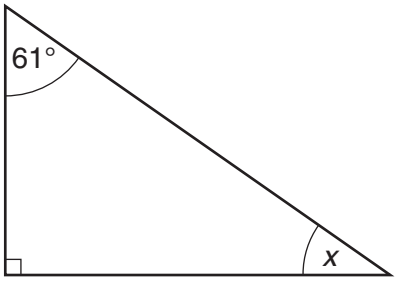
(ii) Ayeesha is 4 times as old as Tony.

Write down an expression for Ayeesha's age.

.....

(ii) _____ **[1]**

14 **(a)** Work out the size of angle x.



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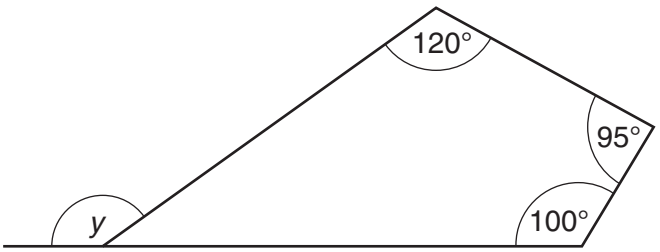
(a) $x =$ _____ °

Give, in words, a reason for your answer.

_____

_____ **[3]**

(b) Work out the size of angle y.



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(b) $y =$ _____ °

Give, in words, reasons for your answer.

_____

_____

_____ **[5]**

15 Joan has a recipe for making chocolate buns.
The recipe uses 150 g of flour and 25 g of cocoa powder to make 12 buns.

(a) How much flour should Joan use to make 18 buns?

.....

.....

(a) _____ g **[2]**

(b) What is 25 g out of 175 g expressed as a percentage?

.....

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

16 Calculate.

(a) $\dfrac{22.4}{3.6 + 2.8}$

.....

(a) _____ **[1]**

(b) $\sqrt{36 + (4.5)^2}$

.....

.....

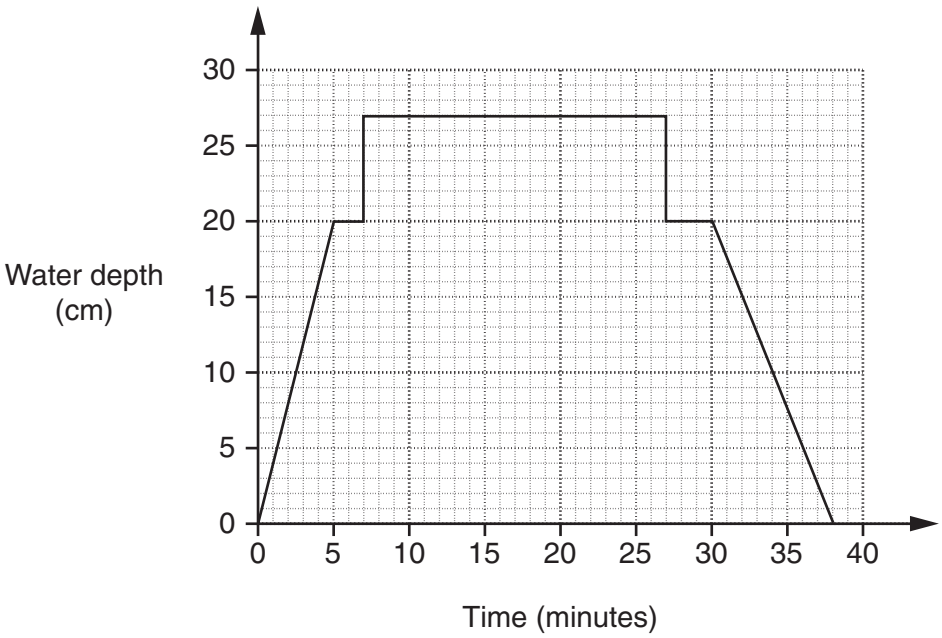
(b) _____ **[2]**

(c) The reciprocal of 0.16.

.....

(c) _____ **[1]**

17 Rachael decides to bath her dog, Oscar. She runs water into the bath, puts Oscar in the bath, baths Oscar, takes him out and then empties the bath.
The graph shows the depth of water in the bath.



(a) Which is quicker, running water into the bath or emptying it?
Explain how you can tell.

_____

_____ **[1]**

(b) By how much does the depth of the water increase in one minute as water runs into the bath?

.....

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

(c) For how long was Oscar in the bath?

.....

(c) _____minutes **[1]**

(d) The volume of the bath water was 119 600 cm^3.

Change 119 600 cm^3 into litres.

.....

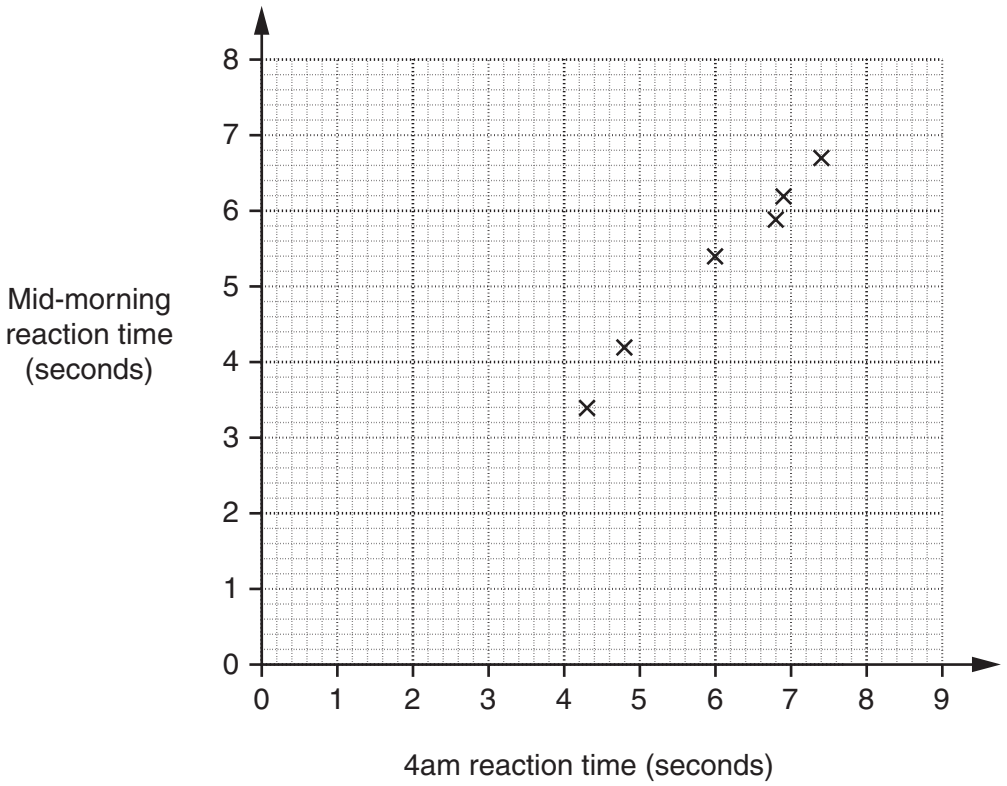
(d) _____ litres **[1]**

18 Sally conducted an experiment on reaction times.
One day ten students were woken at 4 am and their reaction times were measured.
Another day their reaction times were measured mid-morning after a full night's sleep.

The reaction times, in seconds, are shown in the table.

Student	A	B	C	D	E	F	G	H	I	J
4 am reaction time	4.3	6.8	6.9	7.4	6.0	4.8	5.6	4.0	8.5	3.6
Mid-morning reaction time	3.4	5.9	6.2	6.7	5.4	4.2	4.4	3.0	7.5	2.8

The scatter graph shows the reaction times for students A to F.



(a) Complete the scatter graph. **[2]**

(b) Describe the correlation shown.

_____ **[1]**

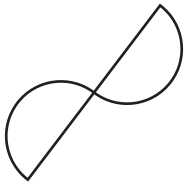
(c) Draw a line of best fit on your graph. **[1]**

(d) Another student, John, has a mid-morning reaction time of 5.0 seconds.

Use your line of best fit to estimate John's reaction time if he was woken at 4 am.

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

19 This logo is made using two semicircles, each with a radius of 6 cm.



Work out the **perimeter** of the logo.
Give the units of your answer.

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_____ **[4]**

20 The capacity of a tank is 8 gallons.
The empty tank was filled with petrol.
The petrol cost 123.9 pence per litre.
1 litre is approximately equal to 0.22 gallons.

Calculate how much it cost to fill the tank with petrol.
Give your answer to an appropriate degree of accuracy.

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£ _____ **[4]**

21 Use trial and improvement to solve this equation.

$$x^3 - x = 10$$

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

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_____ **[4]**

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