



# GENERAL CERTIFICATE OF SECONDARY EDUCATION MATHEMATICS SYLLABUS A

J512/01

Paper 1 (Foundation Tier)

Candidates answer on the question paper

# **OCR Supplied Materials:**

None

#### **Other Materials Required:**

- Geometrical instruments
- Tracing paper (optional)

Monday 18 May 2009 Afternoon

**Duration:** 2 hours



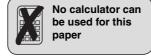
Candidate Forename					Candidate Surname				
Centre Number						Candidate N	umber		

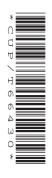
### **INSTRUCTIONS TO CANDIDATES**

- 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**

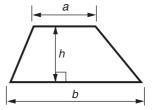
- The number of marks is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is 100.
- This document consists of 20 pages. Any blank pages are indicated.



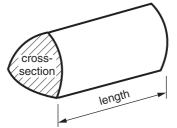


# Formulae Sheet: Foundation Tier

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

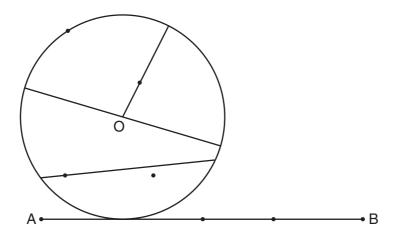


**Volume of prism** = (area of cross-section)  $\times$  length



## PLEASE DO NOT WRITE ON THIS PAGE

1 The diagram shows a circle, centre O, and a line AB.



(a) \_\_\_\_\_ cm [1]

(b) Measure the diameter of the circle in centimetres.

(b) \_\_\_\_\_ cm [1]

There are some dots (•) on the diagram.

(c) Write R by the dot on the radius of the circle. [1]

(d) Write C by the dot on the circumference of the circle. [1]

(e) Write M by the dot at the midpoint of the line AB. [1]

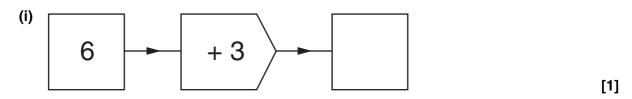
(f) Draw a line parallel to AB. [1]

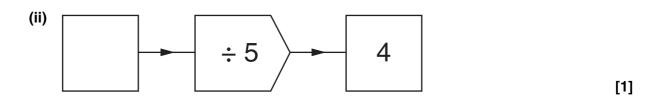
2	(2)	What fraction of each chang is chaded?		
2	(a)	) What fraction of each shape is shaded?		
		(i)		
		(а	)(i)	_ [1]
		(ii)		
			(ii)	_ [1]
	(b)	What fraction of this shape is shaded? Write your answer in its simplest form.		
		TTHE Year another in the emipleon form.		
			(b)	[2]
			. ,	
	(c)	) Write down a fraction that is smaller than $\frac{1}{10}$ .		
			(c)	_ [1]

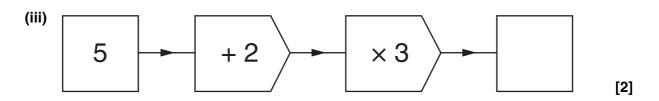
**3** Edmund did a survey to find out what type of pizza people in his school preferred. He represented the results in a pictogram.

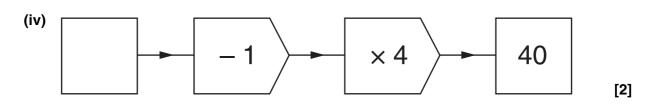
Pizza	Frequency					
Cheese and tomato						
Pepperoni						
Pineapple						
Four Seasons						
Mushroom						
	Key: represents 4 people					
(a) 6 people preferred f	Four Seasons.					
Show this on the pio	ctogram.	[1				
Γhe pictogram is now co	emplete.					
(b) Which is the most p						
	(b)	[1				
(c) How many people of	hose Pepperoni?					
	(c)	[1]				
(d) How many more pe	How many more people chose Pineapple than Mushroom?					
	(d)	ָ נז				
	lid Edmund ask altogether?					
	(a)					
	(e)	. [2				

4 (a) Complete these number machine calculations by filling in the empty boxes.

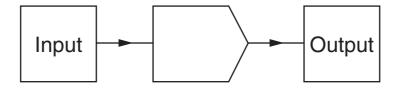








(b) Caroline uses this number machine.



She says that when the Input is 20, the Output will be 10.

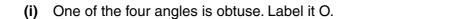
Barney says the rule **must** be -10

Explain why Barney may be wrong.

\_\_\_\_\_[1]

(a) W	ork (	out.					-							
(i	) 32	2 × 100	ı											
								(a)(	i)					[1]
(ii	) 16	60 × 10	1											
								(i	i)					[1]
(iii	) 2	7000 ÷	10											
								(ii	i)					[1]
(iv	) 24	10 ÷ 10	0											
								(iv	<b>/</b> )					[1]
(b) (i	) W	rite 470	66 corı	ect to	the ne	earest	100.							
								(b)(	i)					[1]
(ii	) W	rite 29	81 corı	ect to	the ne	earest	10.							
								(i	i)					[1]
Here is	a lis	t of sco	res.											
4	4	4	4	5	5	5	6	6	10	11	11	14	19	
For the	ese s	cores,	work o	ut										
(a) th	ne rar	nge,												
				•••••	•••••		•••••							
4								(8	a)					[1]
<b>(b)</b> tr	ne me	edian. 												
								(k	o)					[2]
	(iii (iii (iii) (iv) (b) (iii) (iiii) (iii) (iii	(ii) 32 (iii) 16 (iii) 27 (iv) 24 (b) (i) W (ii) W Here is a list 4 4 For these s (a) the ran	(ii) 160 × 10  (iii) 27000 ÷  (iv) 240 ÷ 10  (b) (i) Write 470  (ii) Write 296  Here is a list of sco	(ii) 32 × 100  (iii) 160 × 10  (iv) 240 ÷ 100  (b) (i) Write 4766 corr  (ii) Write 2981 corr  Here is a list of scores.  4 4 4 4  For these scores, work of (a) the range,	(i) 32 × 100  (ii) 160 × 10  (iii) 27000 ÷ 10  (iv) 240 ÷ 100  (b) (i) Write 4766 correct to (ii) Write 2981 correct to (iii) Write 2981 correct to (iii) Here is a list of scores.  4 4 4 4 5  For these scores, work out (a) the range,	(ii) 32 × 100  (iii) 160 × 10  (iii) 27000 ÷ 10  (iv) 240 ÷ 100  (b) (i) Write 4766 correct to the notation of the interval of	(i) 32 × 100  (ii) 160 × 10  (iii) 27000 ÷ 10  (iv) 240 ÷ 100  (b) (i) Write 4766 correct to the nearest (ii) Write 2981 correct to the nearest 4 4 4 4 5 5 5 5  For these scores, work out (a) the range,	(i) 32 × 100  (ii) 160 × 10  (iii) 27000 ÷ 10  (iv) 240 ÷ 100  (b) (i) Write 4766 correct to the nearest 100.  (ii) Write 2981 correct to the nearest 10.  Here is a list of scores.  4 4 4 4 4 5 5 5 6  For these scores, work out  (a) the range,	(i) 32 × 100  (ii) 160 × 10  (iii) 27000 ÷ 10  (iv) 240 ÷ 100  (iv) Write 4766 correct to the nearest 100.  (b) (i) Write 2981 correct to the nearest 10.  (ii) Write 2981 correct to the nearest 10.  (iii) Write 3 × 5 × 6 × 6  For these scores, work out  (a) the range,  (b) the median.	(i) 32 × 100  (a)(i)  (ii) 160 × 10  (iii)  (iii) 27 000 ÷ 10  (iv) 240 ÷ 100  (iv)  (b) (i) Write 4766 correct to the nearest 100.  (b)(i)  (ii)  Here is a list of scores.  4  4  4  4  5  5  5  6  6  10  For these scores, work out  (a) the range,  (b) the median.	(i) 32 × 100  (a)(i)			

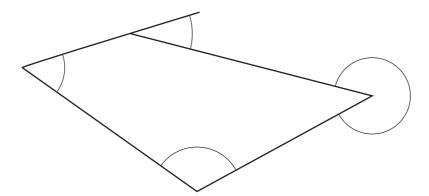
7 (a) In this diagram, four angles have been marked with arcs.



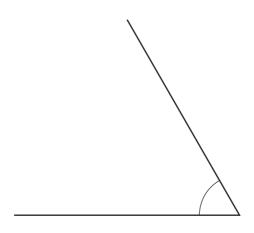
[1]

(ii) One of the four angles is reflex. Label it R.

[1]



(b) Measure the size of the angle below.

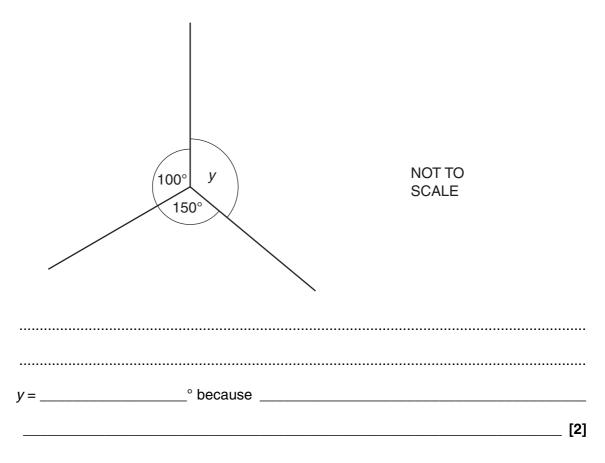


(b) \_\_\_\_\_°[1]

**(c) (i)** Work out the size of angle *x*. Give a reason for your answer.

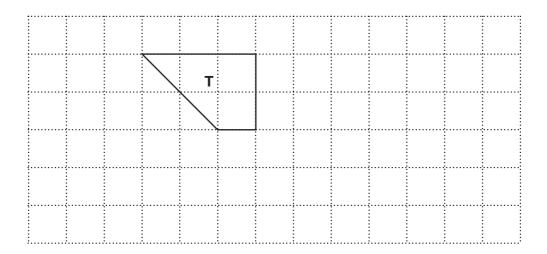
	140° X	NOT TO SCALE
x =	° because	[2]

(ii) Work out the size of angle *y*. Give a reason for your answer.



		h is raising money for charity. b buys candy canes and sells them at a higher price.						
(a	a)	Ruth buys 35 candy canes for 50p each.						
	ا	How much change should she get from a £20 note?						
41			[3]					
(1		She makes 30% profit on each candy cane.						
		Find 30% of 50p.						
			p <b>[2]</b>					
9 (a	a) :	Simplify.						
		(i) $5y + 2y$						
		(a)(i) _	[1]					
	(	(ii) $4w + 3z - 2w + z$						
			[2]					
(1	b) '	Work out the value of $2j + 5k$ when $j = 7$ and $k = 3$ .						
			[2]					

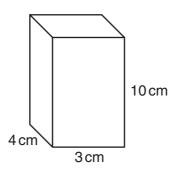
10 (a) Shape T is drawn on a centimetre grid.



Show how shape **T** will tessellate. Draw at least 7 more shapes.

[2]

**(b) (i)** Work out the volume of this cuboid. Give the units of your answer.




o)(i) \_\_\_\_\_\_[3]

(ii) Write down the dimensions of a **different** cuboid that has the same volume as the one in part (b)(i).

.....

Length \_\_\_\_\_cm, Width \_\_\_\_\_cm, Height \_\_\_\_cm [1]

ı vv	ork out.		
(a	) 7 <sup>2</sup>		
		(a)	[1]
(b	a) $2^4 + \sqrt{100}$		
		(b)	[2]
(с	5.5 – 2.22		
		(c)	[1]
(d	1) $\frac{5}{6}$ of 78		
		(d)	[2]

12 Mr Smith did a survey of how students travelled to school. He displayed his results in a table.

Complete the table.			

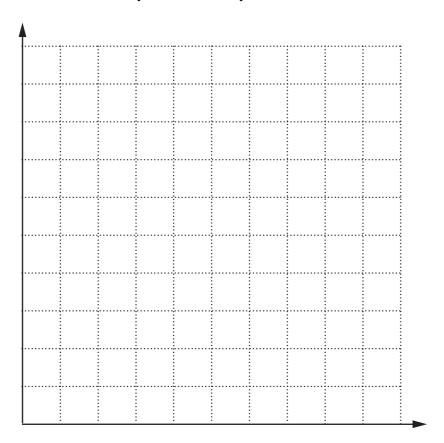
	Bus	Walk	Car	Total
Boys	21		13	57
Girls		8		
Total	40			100

[3]

13 The table shows the distribution of waiting times (in minutes) that customers spent at the checkout of a supermarket.

Waiting time (minutes)	Frequency
0 up to 2	8
2 up to 4	19
4 up to 6	11
6 up to 8	6
8 up to 10	3

(a) Draw a grouped frequency diagram to show this information. Show your scales and label your axes clearly.



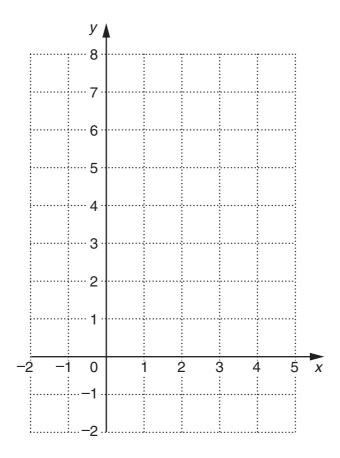
(i	b)	Write down the modal class for these waiting times.			
		(b)	minutes [1]		
(0	c)	One of these customers is chosen at random.			
		What is the probability that this customer waited 6 minutes or more?			
		(c)			
14 (a	a)	The probability that Nouri wins a tennis match is 0.47.			
		What is the probability that he does not win the match? Give a reason for your answer.			
		because			
			[2]		
(I	b)	Sam is told that the probability that his football team will win on Saturday is 0.7. Lizzie says "This means the probability the team will <b>lose</b> on Saturday is 0.3."			
		Explain why Lizzie may be wrong.			
			[1]		

**15** (a) Complete this table for y = 2x + 2.

Х	-2	-1	0	1	2	3
У	-2		2	4		

[1]

**(b)** On the grid, draw the graph of y = 2x + 2 for values of x from -2 to 3.



[2]

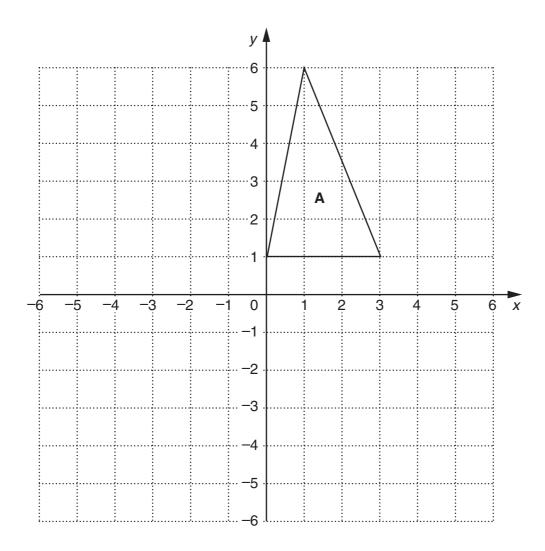
(c) On the grid, draw the graph of y = 5.

[1]

		17		
16	(a)	Solve. $6y - 1 = 29$		
			(a)	[2]
	(b)	Show that $x = 2$ is the solution of this equation.		
		9x - 1 = 4x + 9		
				[2]
	(c)	Solve.		
		$\frac{x}{2} - 3 = 5$		
			(c)	[2]

1 /	(a) In a carton of <i>Squashy</i> , orange juice and water are mixed in the ratio 3 . 7.			
		How many litres of orange juice are needed to make 60 litres of Squashy?		
		(a)li	itres <b>[2</b> ]	
(1	(b)	One carton contains 150 ml of Squashy, correct to the nearest millilitre.		
		What is the least possible amount of Squashy that could be contained in the carton?		
		(h)	mal [4]	

18



(a) Triangle A is drawn on a 1 cm square grid.

	(a)	cm² <b>[2</b>
work out the area of triangle A.		

- (b) Reflect triangle A in the line x = 3.Label the image P.[2]
- (c) Rotate triangle A 90° clockwise about (0,0).

  Label the image Q. [3]

## **TURN OVER FOR QUESTION 19**

19 As a product of prime factors,

 $24 = 2 \times 2 \times 2 \times 3$ .

(a)	Wri	te 40 as a product of prime factors.	
		(a)	
(b)	(i)	Work out the highest common factor (HCF) of 24 and 40.	
		(b)(i)	
	(ii)	Work out the least common multiple (LCM) of 24 and 40.	
		(ii)	



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