OCR
RECOGNISING ACHIEVEMENT

F

GENERAL CERTIFICATE OF SECONDARY EDUCATION

METHODS IN MATHEMATICS

B392/01

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.

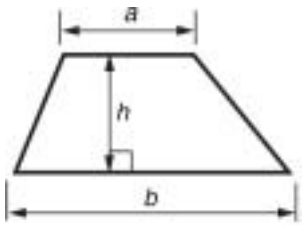
INFORMATION FOR CANDIDATES

- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- The total number of marks for this paper is **90**.
- 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 (*).
- This document consists of **20** pages. Any blank pages are indicated.

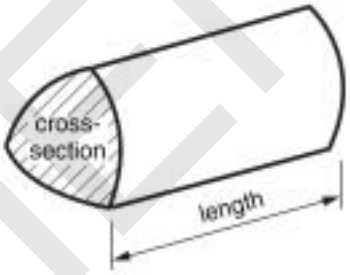
You are permitted to use a calculator for this paper.

Formulae Sheet: Foundation Tier

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



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



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1 **(a)** Write the number eight thousand and forty three in figures.

(a) _____ **[1]**

(b) Round 7684 to the nearest hundred.

(b) _____ **[1]**

(c) Write 0·25 as a fraction.

(c) _____ **[1]**

(d) What percentage of 20 is 7?

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

(e) Use your calculator to work out the following.

(i) $26 - 4 \times 4{\cdot}7$

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

(ii) $24 \div 0{\cdot}6$

(ii) _____ **[1]**

(iii) Calculate.

$$\frac{10{\cdot}7}{3{\cdot}2 + 1{\cdot}7}$$

(iii) _____ **[1]**

2 The table shows distances, in miles, between five cities.

London	Birmingham	Liverpool	Manchester	Southampton
118				
211	98			
209	96	34		
82	145	238	236	

(a) How far is it from London to Liverpool?

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

(b) A lorry driver takes a load of car parts from Southampton to Birmingham.
He then drives to Manchester to pick up a load of Corn Flakes, which he takes to Southampton.

How far is his complete journey?

(b) _____ miles **[3]**

3 Here are three fractions.

$$\frac{2}{5} \qquad \frac{3}{7} \qquad \frac{5}{8}$$

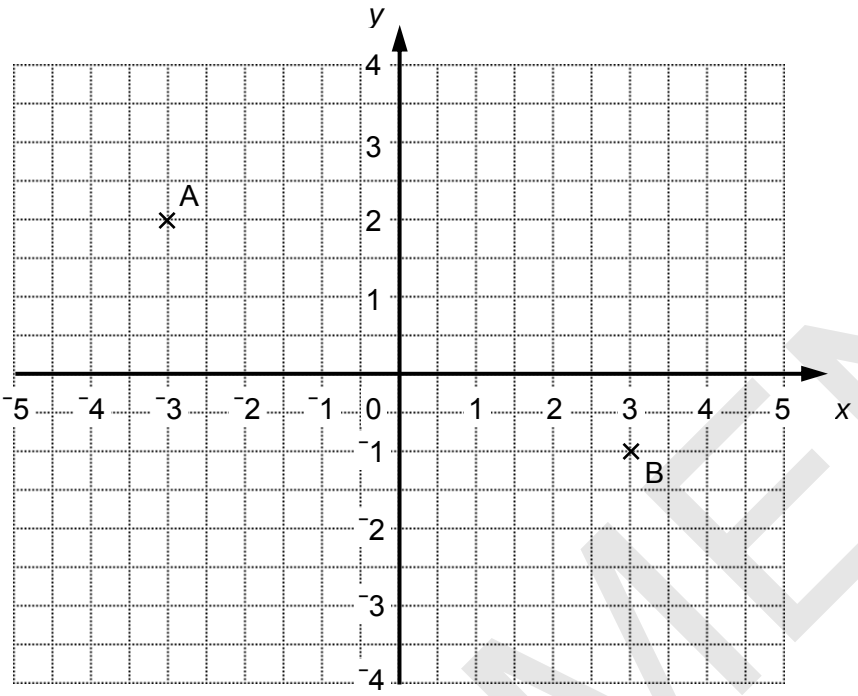
One of these fractions is a different type from the others.

Use your calculator to decide which fraction is the different type.
Give reasons for your answer.

_____

_____ **[3]**

4



(a) Draw the line AB.
Mark the midpoint of the line AB.
Label this point F. **[2]**

(b) Calculate the length of the line AB.
Give your answer correct to 1 decimal place.

(c)_____ **[3]**

5 Saira has 36 square tiles of the same size.
6 of the tiles are blue, 4 are green, 8 are pink and the rest are yellow.

(a) What fraction of Saira's tiles are blue?
Write your answer in its simplest form.

(a) _____ **[2]**

(b) Saira puts all the tiles together to form a rectangle that is 3 tiles wide.

How many tiles long is the rectangle?

(b) _____ **[1]**

(c) How many other, different shaped rectangles could Saira make using all of her tiles?
You must show evidence to support your answer.

(c) _____ **[2]**

6 A family's shopping list is shown below.

(a) Fill in the missing prices.

3 loaves of bread at £1·09 each	£ _____
4·5 kg of potatoes at £0·96 per kg	£ _____
18 eggs at £2·78 a dozen	£ _____
6 tins of beans at _____ per tin	£2·88
Total	£ _____

[3]

(b) How much change would there be from £20·00?

(b) £ _____ **[1]**

7 A family keeps ducks and hens.

(a) There are *d* ducks and *h* hens.
Write an expression to show the total number of ducks and hens.

(a) _____ **[1]**

(b) There are twice as many hens as ducks.
There are 15 birds altogether.

How many hens are there?

(b) _____ **[2]**

8 Solve.

$2(3x - 5) = 8$

_____ **[3]**

9 **(a)** Alan and Briana share 400 marbles in the ratio 1 : 4.

How many marbles does Briana receive?

(a) _____ **[3]**

(b) Clive and Druce share a number of sweets in the ratio 4 :3.

What fraction of the sweets does Clive receive?

(b) _____ **[2]**

(c) Erika makes a drink using 360 ml of squash and 640 ml of water.

Write the ratio of squash to water in its simplest terms.

(c) _____ : _____ **[2]**

10 Guillame likes fruit pastilles and chocolate buttons.
Fruit pastilles have 32 sweets in each packet.
Chocolate buttons have 48 sweets in each packet.

(a) Guillame buys 7 packets of fruit pastilles and 9 packets of chocolate buttons.

Work out how many sweets Guillame will have.

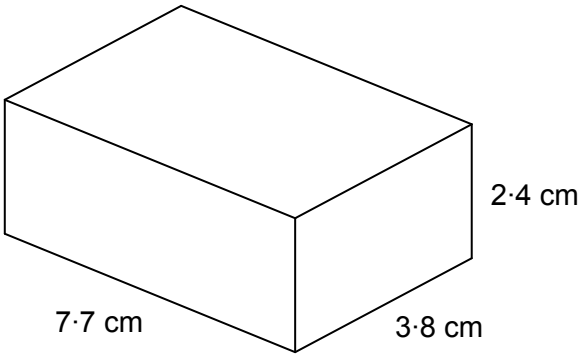
(a) _____ **[2]**

(b) Toby buys 4 packets of pastilles and some packets of chocolate buttons. In total he has 464 sweets.

How many packets of chocolate buttons does Toby buy?

(b) _____ **[2]**

11



A closed cardboard box measures 7·7 cm long by 3·8 cm wide by 2·4 cm high.

(a) Work out the volume of the box.
Give your answer correct to 3 significant figures.

(a) _____ cm^3 **[3]**

(b) Calculate the total surface area of the box.

(b) _____ cm^2 **[3]**

(c) The box is to be used to hold a present. It will have a ribbon tied around it as shown. 40 centimetres of ribbon are needed to make the bow.

What is the shortest length of ribbon that is needed to tie up the present?

_____ cm **[3]**

12* Harjinder and Ahisha want to tile their kitchen floor.
Harjinder sees blue square tiles of side length 15 cm and white regular octagonal tiles of side length 15 cm.
Harjinder says that these two sorts of tiles can be used together to tile the kitchen floor.
Ahisha says that they will not fit together.

Explain which of them is correct.
You may wish to use diagrams to help your explanation. **[4]**

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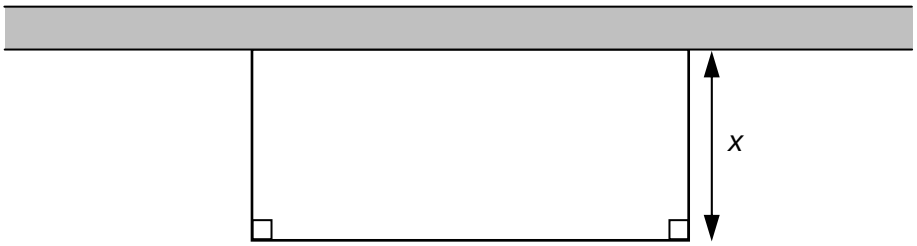
TURN OVER FOR THE NEXT QUESTION

13 Farmer Barber has 20 metres of fence.
She wishes to use it to make a rectangular hen run next to her garden wall.
Each hen must have at least $3\,m^2$ of space to meet farming guidelines.



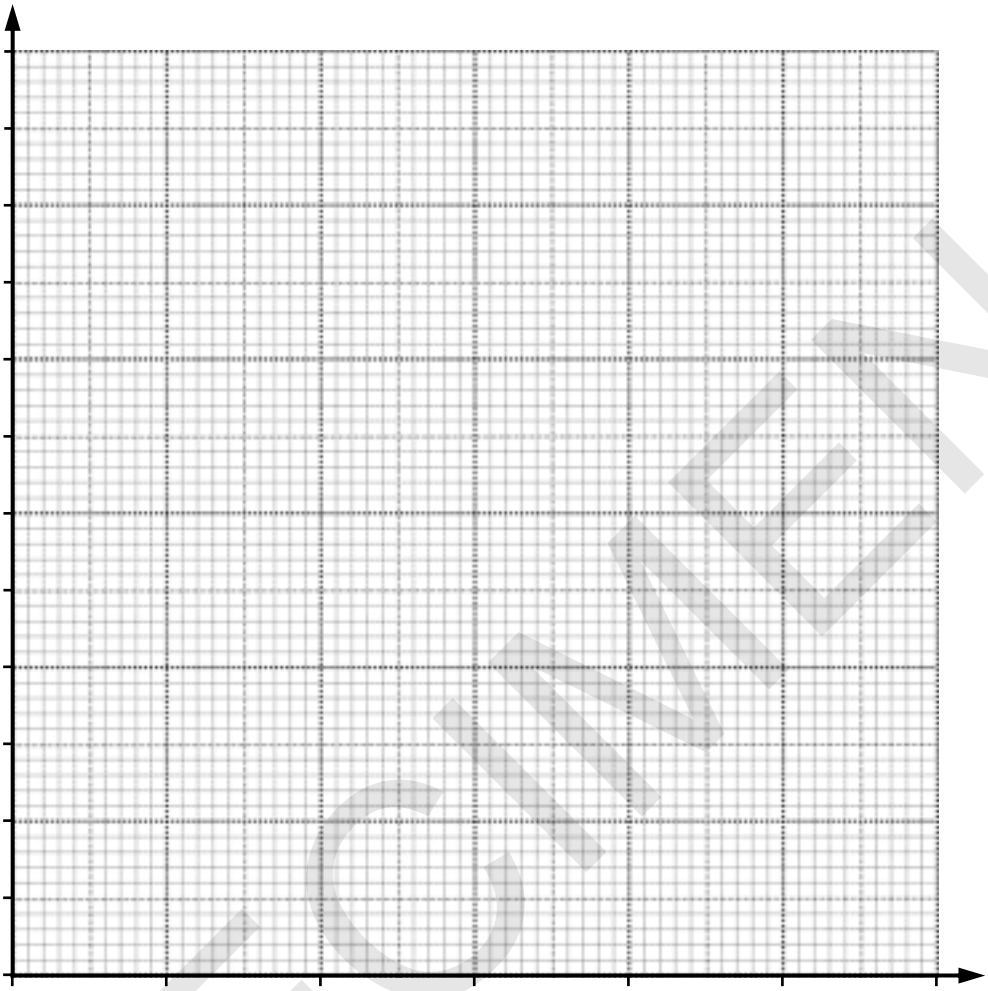
The width of the hen run is x metres as shown on the diagram.

(a) Show that the length of the hen run is $(20 - 2x)$ metres.

[1]

(b)* Use the information to decide how many hens Farmer Barber can keep in her hen run.
You must support your answer with evidence.
You may use this table and the grid on the following page to help work out your answer.

x	0	1	2	3	4	5	6	7	8	9	10
$20 - 2x$											



_____ **[6]**

14. In a group of students:

- 30% have brown hair
- $\frac{3}{8}$ have black hair
- 13 have hair of other colours.

How many students are in the group?

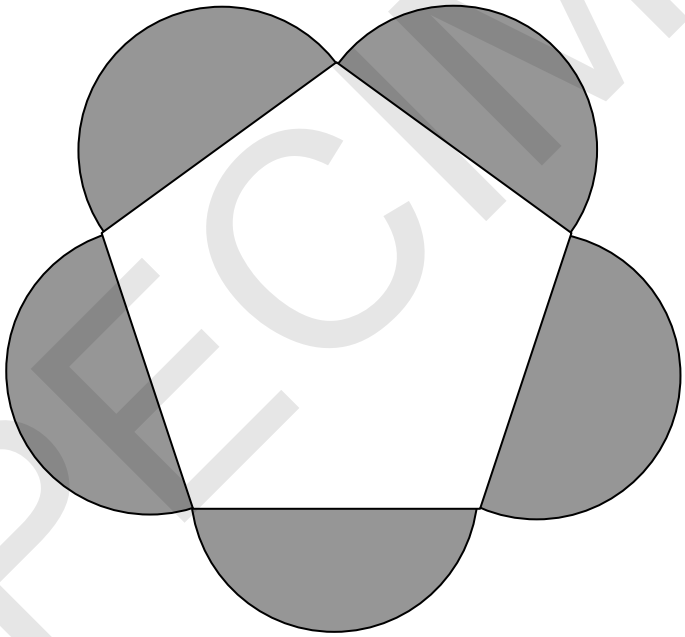
_____ **[5]**

15 (a) Calculate the size of an interior angle of a regular pentagon.

(a) _____ ° **[2]**

(b) This shape is made by drawing semicircles on each of the sides of a regular pentagon.
The perimeter of the pentagon is 30 cm.

Calculate the shaded area.



(b) _____ cm^2 **[4]**

16 Here are the first four numbers in a sequence.

5 8 11 14

(a) Write down the tenth number in the sequence.

(a) _____ **[1]**

(b) Write down an expression for the nth number in the sequence.

(b) _____ **[2]**

(c) John claims that the sequence will not include the number 200.

Is John correct?

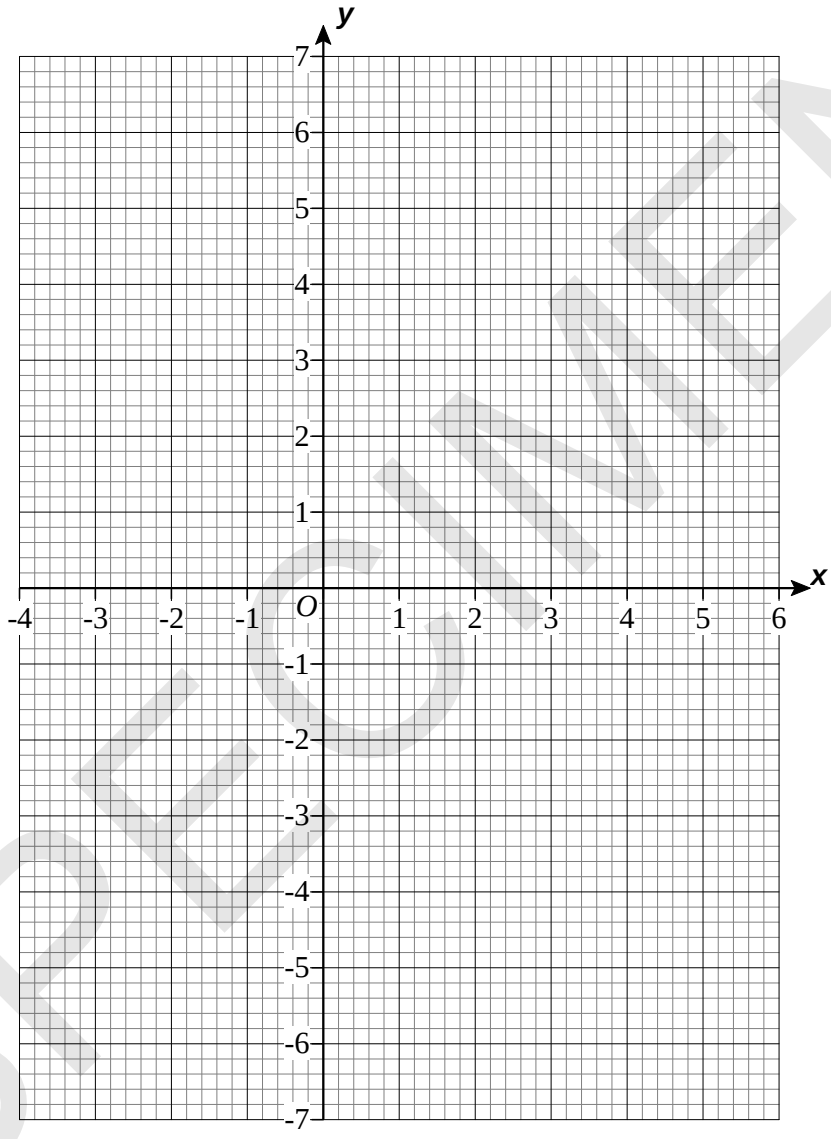
(b) _____ **[3]**

17 **(a)** Complete the table for the equation $y = x^2 - 2x - 4$.

x	-2	-1	0	1	2	3	4
y	4	-1					

[2]

(b) On the grid, draw the graph of $y = x^2 - 2x - 4$.



[3]

(c) From your graph find

(i) the values of x when $y = 0$,

(c)(i) _____ and _____ **[2]**

(ii) the minimum value of y.

(ii) _____ **[1]**

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OXFORD CAMBRIDGE AND RSA EXAMINATIONS

General Certificate of Secondary Education

METHODS IN MATHEMATICS B392/01

Paper 2 (Foundation)

Specimen Mark Scheme

The maximum mark for this paper is **90**.

This document consists of **5** printed pages and **1** blank page.

1	**(a)**	8043	**1**	
	(b)	7700	**1**	
	(c)	$\frac{1}{4}$	**1**	
	(d)	35	**1**	
	(e)	**(i)** 7·2	**1**	
		(ii) 40	**1**	
		(iii) 2·18(367)	**1**	
2	**(a)**	211	**1**	
	(b)	145 + 96 + 236 477	**1** **1** **1**	At least one correct number from table. Attempt to add together 3 sensible numbers cao
3		Sight of 0.4 and 0.625 sight of 0·428... clearly as a non-terminating decimal identify $\frac{3}{7}$ and give a correct reason	**1** **1** **1**	
4	**(a)**	Straight line drawn from B to A Their midpoint marked	**1** **1ft**	Can be freehand follow through
	(b)	Use of Pythagoras = $\sqrt{(6^2 + 3^2)}$ 6·7(08...)	**1** **1** **1**	sight of 'their' $6^2 + 3^2$ sufficient accept 'their' wrong values if clear from working. Ignore "units" throughout
5	**(a)**	$\frac{6}{36}$ oe $\frac{1}{6}$	**1** **1**	Award for 4, 6, 8, or 18 as numerator cao
	(b)	12	**1**	
	(c)	Indicates at least one other rectangle (not counting 3 x 12) Completely correct answer	**1** **1**	 4 from 1 x 36, 2 x 18, 4 x 9 and 6 x 6 or 8 from 1 x 36, 2 x 18, 3 x 12, 4 x 9, 6 x 6, 9 x 4, 18 x 2, 36 x 1

6	**(a)**	3·27 4·32 4·17 48(p) 14·64	**3**	**1** mark for 1 entry correct **2** marks if more than 1 entry, but not all, correct **3** marks if totally correct
	(b)	5·36	**1ft**	
7	**(a)**	$d + h$	**1**	
	(b)	10 www	**2**	If wrong, allow **SC1** for any sensible start, eg, $h = 2d$ or $d + h = 15$
8		$3x - 5 = 4$ or $6x - 10 = 8$ $3x = 9$ or $6x = 18$ $x = 3$	**1** **1** **1**	Allow one slip for each method mark. cao
9	**(a)**	5 shares 400 ÷ 5 (= 80) 320	**B1** **M1** **A1**	
	(b)	7 shares $\frac{4}{7}$	**1** **1**	
	(c)	9:16 accept $1 : 1\frac{7}{9}$ oe accept 0·5625 : 1	**2**	Allow 1 mark for 16:9, or for some cancelling (eg 180:320).
10	**(a)**	656	**2**	If wrong, allow **B1** for 224 or 432 seen, or **M1** for correct method clearly seen
	(b)	7	**2**	If wrong, or wrong working, allow **B1** for 336 seen, or **M1** for correct method clearly seen

11	**(a)**	7·7 × 3·8 × 2·4 = 70·224 70·2 (3sf)	**1** **1** **1ft**	If full answer not shown, 70·2 can imply first **A1**. Allow ft for correctly rounding wrong answer if of equivalent difficulty
	(b)	7·7 × 3·8 + 3·8 × 2·4 + 2·4 × 7·7 Using all 6 sides 113·72 Accept 114 or better, www	**1** **1** **1**	Award for 2 correct rectangular faces cao
	(c)	Use front, back, top and bottom OR both sides, top and bottom Use all 8 lengths + 40cm 72·6 cm (accept 73 cm)	**1** **1** **1**	Implied by 2.4 + 2.4 + 7.7 + 7.7 (= 20.2) OR 2.4 + 2.4 + 3.8 + 3.8 (= 12.4) Need not be worked out
12*		A full, clearly expressed, and complete explanation indicating that Harjinder is correct showing how a square and two octagons can fit together. This will include the fact that the corners of a square are 90° and of an octagon 135°. The explanation can be in words with or without a diagram. Clear calculation of the internal angles of a square and/or octagon, and knowledge of tessellations provided eg calculation of the internal angle of a regular octagon and attempt to fit these together. No relevant comment or calculation.	**3-4** **1-2** **0**	For lower mark – diagram showing angles of 135°, 135° and 90° meeting at a point with poorly expressed, explanation. For lower mark – diagram showing angles of 135°, 135° and 90° meeting at a point with no supporting evidence.

13	**(a)**	Convincing explanation	**1**	
*	**(b)**	A full solution and clear explanation of the problem, ending up with the conclusion that 16 hens can be kept. This may be done by completing the table, using the grid to draw a graph, or equivalent valid method.	**5-6**	For lower mark – a full solution but the number of hens has been rounded up to 17, this may be done by completing the table, using the grid to draw a graph, or equivalent valid method or the explanation is not clear, or contains a minor error in the calculation.
		A substantial but incomplete solution e.g. first line of table completed correctly, calculation of areas completed and an attempt to calculate the number of hens or some calculation errors in a complete solution. An explanation of the calculations required will be provided	**3-4**	For lower mark – An answer of 16 or 17 will have been produced, possibly justified by working on the table or grid, but with no explanation provided..
		First line of table completed correctly and a little further progress towards a solution. Some attempt at providing an explanation which may be poorly expressed.	**1-2**	For lower mark – first line of table completed with errors and/or omissions, little by way of a commentary.
		No relevant comment or calculation.	**0**	
14		Conversion of 30% or $\frac{3}{8}$	**M1**	eg 30% = $\frac{3}{10}$ or $\frac{3}{8}$ = 37·5%
		Addition of equivalents	**M1**	eg 0.30 + 0·375 or $\frac{3}{10}$ + $\frac{3}{8}$
		Subtraction from 1	**M1**	eg 1 – 0·675 or 1 – $\frac{54}{80}$ o.e.
		Equating remainer to 13	**M1**	eg 0·325 = 13 or $\frac{26}{80}$ = 13
		40	**A1**	any equivalent method eg %.
15	**(a)**	108°	**2**	**M1** for (5 – 2) × 180 or 360/5
	(b)	Use or πr^2	**1**	Accept if ½ included here
		Use of radius of circle is 3 cm	**1**	Award also if '6' used
		use of 'x 5⁄2'	**1**	
		70·6(8...)	**1**	Accept 70·7 or 71.
16	**(a)**	32	**1**	
	(b)	3*n*	**1**	
		+2	**1**	
	(c)	Formulates 3*n* + 2 = 200	**1**	Allow ft for their '3*n* + 2' if it involves *n*
		Solves to give *n* = 66	**1**	Allow ft as above
		Correct conclusion – John is not correct	**1**	CAO – from correct working

17	**a**	-4, -5, -4 -1, 4	**1** **1**	for one of these seen correct for all 5 correct
	b	points correctly plotted smooth curve drawn	**2** **1**	2 for all plotted, and 1 for 3 plotted
	ci	-1.2 3.2	**1** **1**	follow through their smooth curve
	cii	-5	**1**	follow through their smooth curve

Assessment Objectives

GCSE Methods in Mathematics

B392/01 (Foundation)

Qn	AO1	AO2	AO3
1	7		
2		4	
3		3	
4	5		
5		3	2
6	4		
7	3		
8	3		
9	7		
10		2	2
11	6	3	
12*			4
13*	1		6
14			5
15		2	4
16	3	3	
17	7	1	
TOTAL	46	21	23