OCR
RECOGNISING ACHIEVEMENT

SPECIMEN

GENERAL CERTIFICATE OF SECONDARY EDUCATION

MATHEMATICS

Unit 2 (Foundation Tier)

Specimen

F

B812

Time: 1 hour 30 minutes

Candidates answer on the question paper
Additional Materials:
Electronic calculator
Geometrical instruments
Tracing paper (optional)

Candidate Name	

Centre Number						Candidate Number				

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above.
- Answer **all** the questions.
- Use blue or 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.
- Do **not** write in the bar code.
- Do **not** write outside the box bordering each page.
- Write your answer to each question in the space provided.

INFORMATION FOR CANDIDATES

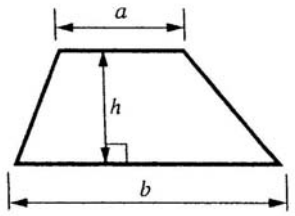
- The number of marks is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is 100.
- You are expected to use an electronic calculator for this paper.
- Use the π button on your calculator or take π to be 3.142 unless the question says otherwise.

FOR EXAMINER'S USE

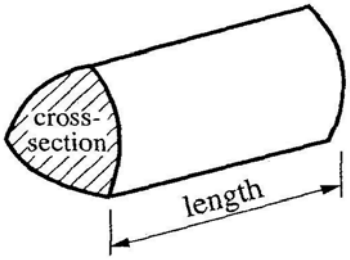
This document consists of **18** printed pages.

Formulae Sheet: Foundation Tier

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



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



1 A chef is making a salad for 160 people.

(a) Rice costs £1.20 per kilogram.
The total amount of rice needed is 3.2 kg.

How much will the rice cost?

.....

(a) £..... [1]

(b) Each person will need 0.08 kg of beetroot.

How much beetroot is needed to make the salad?

.....

(b)..... kg [1]

(c) 24 cucumbers are needed to make the salad.
The total cost of the cucumbers is £20.40.

How much does each cucumber cost?

.....

(c) £ ..... [1]

(d) 480 tomatoes are needed altogether.

(i) How many tomatoes is this for each person?

.....

(d)(i) ..... [1]

(ii) 20 tomatoes cost £4.40.

What is the total cost of tomatoes for the salad?

.....

(ii) £ ..... [2]

(e) Each person will need $\frac{1}{8}$ of a lettuce.

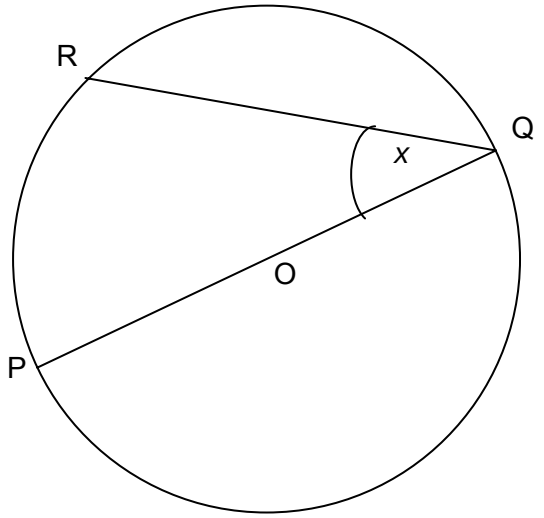
How many lettuces are needed?

.....

(e) ..... [1]

[Turn over

2



The diagram shows a circle, centre O.

(a) What is the mathematical name of

(i) the line OP,

(a)(i) ..... [1]

(ii) the line PQ,

(ii) ..... [1]

(iii) the line RQ?

(iii) ..... [1]

(b) Which of the words below describes angle *x*?

Obtuse	Reflex	Acute

(b) ..... [1]

3 **(a)** A bird is flying 17 metres above the top of a cliff.
The top of the cliff is 135 metres above sea level.

How high is the bird above sea level?

.....

(a) ..... m [1]

(b) The temperature in Aberdeen changes from $-2\ ^{o}C$ to $-6\ ^{o}C$.

(i) Does this temperature change make it colder or warmer?

(b)(i) ..... [1]

(ii) By how many degrees has the temperature changed?

.....

(ii) ..... ^{o}C [1]

4 **(a)** Subtract 9.45 from 10.

(i) Write your answer as a decimal.

(a)(i) ..... [1]

(ii) Change your answer to part **(i)** into a fraction.
Give the fraction in its simplest form.

.....

(ii) ..... [2]

(b) Find $\sqrt{2.25}$.

.....

(b) ..... [1]

[Turn over

5 **(a)** Write 3.30pm using the 24-hour clock.

(a) ..... [1]

(b) The length of a window is 185 centimetres.

Write this measurement in **metres**.

(b) ..... m [1]

(c) A baby weighs 4.1 kilograms.

How many **grams** is this?

(c) ..... g [1]

(d) A metal bar is 5 millimetres thick.

Write this measurement in **centimetres**.

(d) ..... cm [1]

(e) 1 mile is approximately 1.6 kilometres.

Use this approximation to change 2.5 miles into kilometres.

.....

(e) ..... km [1]

(f) 1 gallon is approximately 4.55 litres.

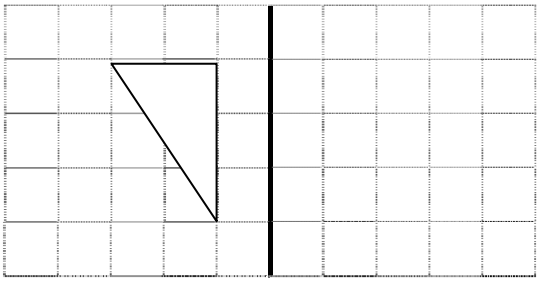
Use this approximation to change 91 litres into gallons.

.....

(f) ..... gallons [1]

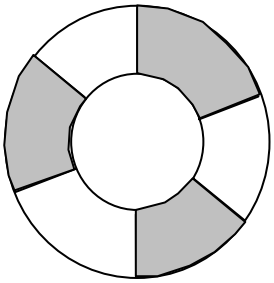
6 Sean is designing a logo for his company.

(a) His first design has reflection symmetry.



On the grid reflect the triangle in the mirror line. [1]

(b) Sean's second design is shown below.



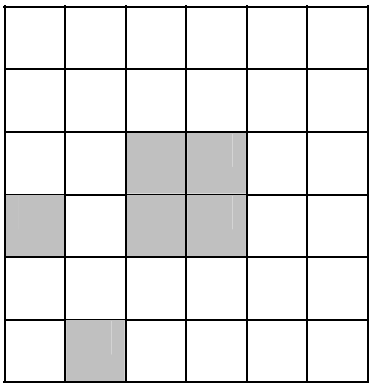
(i) How many lines of symmetry does this design have?

(b)(i) ..... [1]

(ii) What is the order of rotation symmetry of this design?

(ii) ..... [1]

(c) His third design uses a pattern of black and white squares.

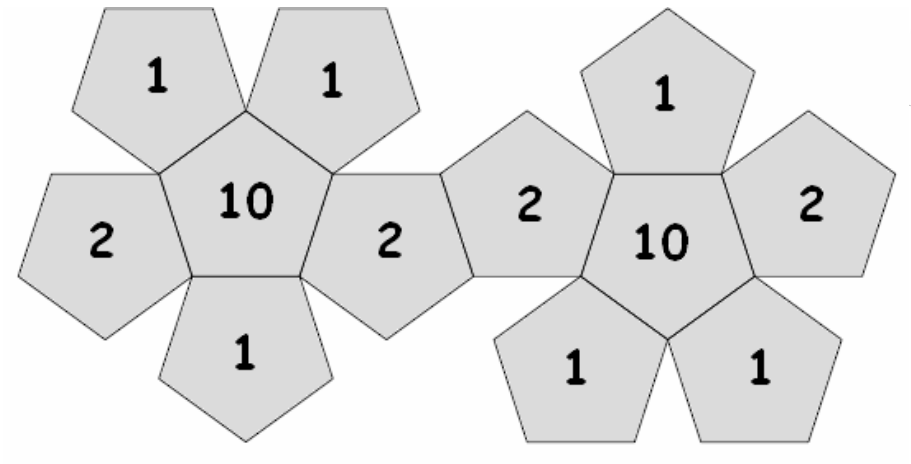


This design has rotation symmetry of order 4.

Complete the design by shading 6 more squares. [2]

[Turn over

7 The diagram below shows the net of a fair 12-sided dice.
The net shows how the faces are numbered.



(a) When the fair 12-sided dice is thrown what is the probability of scoring

(i) a 10,

.....

(a)(i) ..... [1]

(ii) an odd number,

.....

(ii) ..... [1]

(iii) a 3?

.....

(iii) ..... [1]

(b) Sanjay and Bruce make up a game using the dice.
They take it in turns to throw the dice.

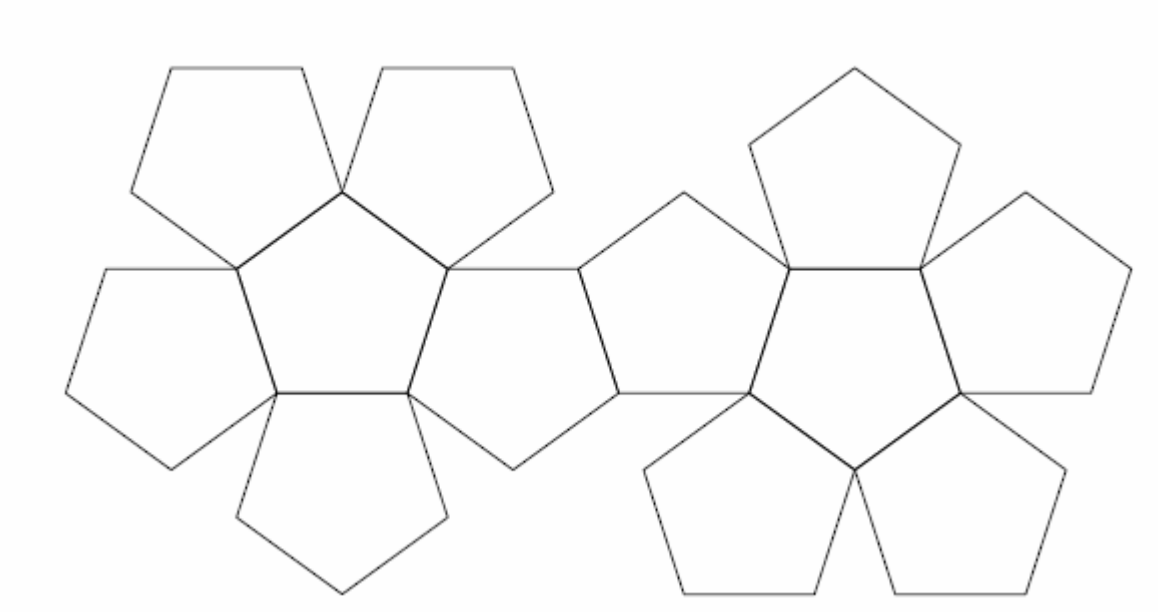
If Sanjay gets an odd number then he scores a point.
If Bruce gets an even number then he scores a point.

Is this a fair game?
Explain how you know.

..... because .....

..... [2]

(c) Here is a blank net for a fair 12-sided dice.



Write a 1, 2 or 10 on each face of the dice so that

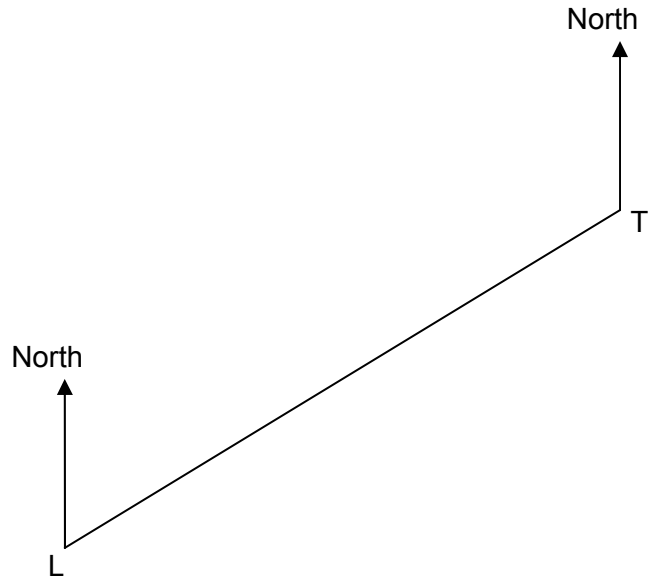
- 1 and 2 are equally likely

and

- 10 is twice as likely as 2. [3]

[Turn over

8



Scale: 1 centimetre represents 0.25 kilometres.

The map shows the positions of the Town Hall (T) and the Library (L) in a town.

(a) Measure and write down the bearing of T from L.

(a) .....° [1]

(b) The Post Office (P) is 0.75 km from the Town Hall (T) on a bearing of 125°.

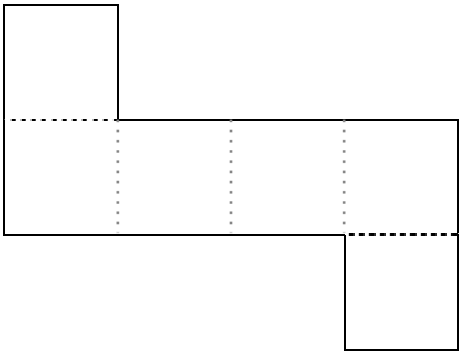
Mark the position of P on the map. [3]

(c) Use the map to find the **actual distance** of the Town Hall from the Library.

.....

(c) ..... km [2]

9



The diagram shows a shape that can be folded to make a cube.
The sides of each square are 1.7 cm long.

(a) Calculate

(i) the perimeter of the shape,

.....

(a)(i) ..... cm [1]

(ii) the area of the shape,

.....

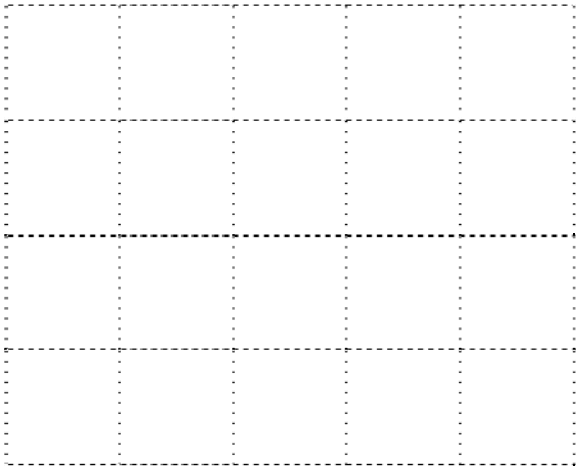
(ii) ..... cm^2 [2]

(iii) the volume of the cube made when the shape is folded.

.....

(iii) ..... cm^3 [2]

(b) On the grid, sketch a different shape which can also be folded to make a cube.



[2]

[Turn over

10 The rainfall, in millimetres, in Banjul (the capital of The Gambia) is shown below.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2	2	0	0	19	85	254	448	285	82	21	2

(a) For these rainfall figures find

(i) the mean,

.....

.....

.....

(a)(i) ..... mm [3]

(ii) the median,

.....

.....

(ii) ..... mm [2]

(iii) the mode.

.....

(iii) ..... mm [1]

(b) Explain why none of the three answers to part **(a)** would be useful on its own to describe the rainfall in Banjul.

.....

..... [2]

(c) Name two different types of statistical diagram which could be used to represent this information.

(c) ..... and ..... [2]

11 Jenny finds these two formulas in a book.

Formulas to calculate maximum heart rate

[1] $H = 220 - A$

[2] $H = 208 - 0.7A$

H = maximum heart rate in beats per minute.

A = person's age in years.

Jenny is 14 and her grandfather is 65.

Use both formulas for Jenny and her grandfather.
Comment on your results.

.....

.....

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.....

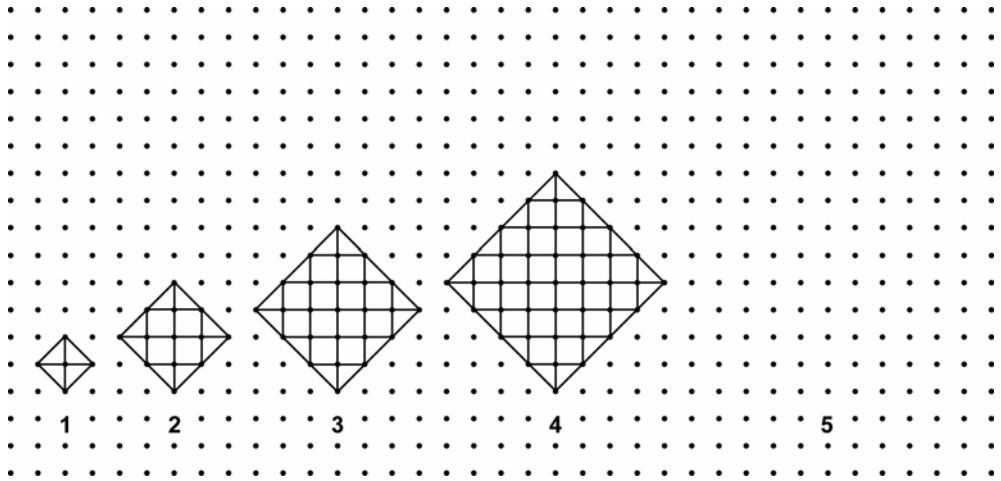
.....

.....

..... [5]

[Turn over

12 **(a)**



(i) On the grid above, draw Diagram 5 in this sequence of shapes. [1]

(ii) Each diagram in the sequence is made from squares and triangles.

Complete the table.

Diagram	1	2	3	4	5
Number of squares	0	4			
Number of triangles	4	8	12		

[3]

(iii) The number of triangles in each shape forms a sequence.

Write down the term-to-term rule in words.

.....

(a)(iii) ..... [1]

(b) The nth term of a sequence is given by $n^2 - 1$.

Write down the first three terms.

.....

(b) ....., ..., ... [2]

(c) Here are the first five terms of another sequence.

2 6 10 14 18

Work out the formula for the nth term of this sequence.

.....

(c) ..... [2]

13 **(a)** Write an expression for the total cost of x concert tickets at £35 each.

.....

(a) ..... [1]

(b) When $p = 1.4$ work out the value of $5p$.

.....

(b) ..... [1]

(c) When $r = 9$ and $s = 2$, work out the value of $3r + 2s$.

.....

(c) ..... [2]

(d) Simplify $y + 7y - 2y$.

.....

(d) ..... [1]

(e) Solve.

(i) $2(2x - 5) = 18$

.....

.....

.....

(e)(i) ..... [3]

(ii) $\frac{14 + x}{4} = 2$

.....

.....

.....

(ii) ..... [3]

[Turn over

14 Mr Black is looking at cheaper ways of paying for the gas he uses.
He has received the following details from two companies.

GASCOM	UGAS
Standing charge per month: £1.00 Cost per kWh: 2.99p	Standing charge per month: £3.78 Cost per kWh: 2.38p

Mr Black estimates that he will use 4000 kWh in the next 3 months.

From which company would his gas bill be cheaper and by how much?

.....

.....

.....

.....

.....

.....

..... by £ ..... [5]

15 Express 36 as the product of its prime factors.

.....

.....

.....

..... [2]

16 (a) In 2006, the production cost of the Newton School play was £370.
In 2007, the production cost increased by 12%.

Work out the production cost in 2007.

.....

.....

(a) £ ..... [3]

(b) In 2006, the total number of tickets sold for the play was 732.
The ratio of adult tickets to student tickets was 42 : 19.
In 2006, adult tickets cost £3 each and student tickets cost £1.50 each.

Work out the total amount received by Newton School from selling the tickets.

.....

.....

.....

.....

.....

(b) £ ..... [5]

OXFORD CAMBRIDGE AND RSA EXAMINATIONS

GCSE

MATHEMATICS B812

Unit 2 (Foundation Tier)

Specimen Mark Scheme

The maximum mark for this paper is 100.

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

B812 Specimen Mark Scheme

1	**(a)**	3.84	**1**	Accept 384p
	(b)	6.4	**1**	
	(c)	0.85	**1**	Accept 85p
	(d) **(i)**	3	**1**	
	(ii)	105.6(0)	**2**	Accept 10560p **M1** for 480 ÷ 20 × 4.4 oe **SC1** for 24 seen
	(e)	20	**1**	
2	**(a)** **(i)**	radius	**1**	
	(ii)	diameter	**1**	
	(iii)	chord	**1**	
	(b)	acute	**1**	
3	**(a)**	152	**1**	
	(b) **(i)**	colder	**1**	
	(ii)	4	**1**	Accept 4
4	**(a)** **(i)**	0.55	**1**	
	(ii)	11/20	**2**	**B1** for 55/100 seen
	(b)	1.5	**1**	
5	**(a)**	1530	**1**	
	(b)	1.85	**1**	
	(c)	4100	**1**	
	(d)	0.5	**1**	
	(e)	4	**1**	
	(f)	20	**1**	
6	**(a)**	Correct reflection	**1**	
	(b) **(i)**	3	**1**	
	(ii)	3	**1**	
	(c)	Correct pattern	**2**	**B1** for one error in the pattern

7	**(a) (i)**	2/12 oe	**1**	
	(ii)	6/12 oe	**1**	
	(iii)	0	**1**	Accept word zero
	(b)	Yes (it is a fair game)(because) each player has an equal chance of winning	**1** **1**	Dependent on an attempt at the correct reason oe
	(c)	3 ones 3 twos 6 tens	**1** **1** **1**	If zero scored: **SC1** for equal numbers of 1s and 2s **or** the number of 10s is 2 x number of 1s **or** the number of 10s is 2 x number of 2s
8	**(a)**	(0)59	**1**	
	(b)	Correct position P ±1mm and ±2^o	**3**	Accept correct position P without line drawn from T **M1** for any 3cm ± 1mm line drawn from T **M1** for correct bearing 125^o ± 2^o with line from T
	(c)	8.5 to 8.7	**1**	
		2.125 to 2.375	**1**	
9	**(a) (i)**	23.8	**1**	
	(ii)	17.3(4)	**2**	**M1** for 1.7 × 1.7 × 6 oe
	(iii)	4.91(3)	**2**	**M1** for 1.7 × 1.7 × 1.7
	(b)	Correct net	**2**	**M1** for shape outline around 6 connected squares **SC1** for congruent net, other than given net
10	**(a) (i)**	100	**3**	**M2** for *their*(Σx) ÷ 12 **or M1** for Σx
	(ii)	20	**2**	**M1** for numbers ranked in order
	(iii)	2	**1**	
	(b)	Variation in rainfall too big	**2**	**B1** for correct reason not to use mean **or B1** for correct reason not to use median **or B1** for correct reason not to use mode
	(c)	Bar chart, line graph	**1,1**	Accept any correct names
11		Four correct H values	**M1** **A1** **M1** **A1**	
		Correct conclusion from *their* results	**1**	

12	**(a)** **(i)**	Correct shape drawn	**1**	Accept without internal lines drawn
	(ii)	<table><tr><td>12</td><td>24</td><td>40</td></tr><tr><td></td><td>16</td><td>20</td></tr></table>	**3**	**B2** for 4 correct **B1** for 3 correct
	(iii)	Add 4	**1**	oe
	(b)	0, 3, 8	**2**	**B1** for 1 correct term
	(c)	$4n - 2$ oe	**2**	**B1** for $4n$ oe seen
13	**(a)**	$35x$	**1**	
	(b)	7	**1**	
	(c)	31	**2**	**M1** for 27 + 4
	(d)	$6y$	**1**	
	(e) **(i)**	(x =) 7 ww algebraic w	**3**	**M1** for $4x - 10$ **and M1** for x = b/a from *their* ax = b with a ≠ 1
	(ii)	(x =) –6 ww algebraic w	**3**	**M2** for $14 + x = 8$ **M1** for correctly solving *their* a + bx = c
14		UGAS by (£)16.06 www	**5**	GASCOM **M1** for 3 + 4000 × 0.0299 **A1** for 122.6(0) After 0 scored **SC1** for 11963 seen **and** UGAS **M1** for 3 × 3.78 + 4000 × 0.0238 **A1** for 106.54 After 0 scored **SC1** for 9531…seen
15		$2^2 \times 3^2$ oe	**2**	**M1** for one prime factor seen
16	**(a)**	414.40	**3**	**M2** for 370 × 1.12 oe **M1** for 370 × 0.12 oe soi by 44.4(0)
	(b)	504	**2**	**M1** for 732 × 42 ÷ 61 **or SC1** for 228
		1854	**3**	**M2** for *their*(504) × 3 + ((732 – *their*504) ×1.5) **or M1** for 732 – *their*504 seen

Assessment Objectives Grid

Question	AO1	AO2	AO3	Total
1		7		**7**
2	4			**4**
3	3			**3**
4	4			**4**
5	3	3		**6**
6	5			**5**
7	3		5	**8**
8	1	5		**6**
9	5		2	**7**
10	8	2		**10**
11			5	**5**
12	5	4		**9**
13	11			**11**
14			5	**5**
15	2			**2**
16		3	5	**8**
Totals	**54**	**24**	**22**	**100**

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