

# **GCSE MARKING SCHEME**

# METHODS IN MATHEMATICS (LINKED PAIR PILOT)

**SUMMER 2014** 

#### INTRODUCTION

The marking schemes which follow were those used by WJEC for the Summer 2014 examination in GCSE METHODS IN MATHEMATICS (LINKED PAIR PILOT). They were finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conferences were held shortly after the papers were taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conferences was to ensure that the marking schemes were interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conferences, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about these marking schemes.

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## UNIT 1 (FOUNDATION TIER)

Methods in Mathematics June 2014 Unit 1 Foundation Tier	Mark	Comments
1. (a) (i) 19004	B1	
(ii) five hundred and fifty thousand	B1	
(b) (i) 380	B1	
(ii) 16	B1	
(iii) 54	B1	
(iv) 13	B1	
(c) (i) 2190	B1	
(ii) 54000	B1	
	8	
2.	B4	B1 for each correct answer
Reads of output time     CEXTAIN       Proprior context time     IXXIX       Proprior context time     IXXIX		
Denotes is made : 1 den influe to it material i s	4	
3. Right angle	B1	
90(°)	E1	
Obtuse angle	B1	
Greater than 90(°) AND less than 180(°)	E1	Accept 90(°) - 180(°), between 90(°) and 180(°)
	4	
4. 1st Diagram Circle : 4	B1	
Square : 5	B1	
2 <sup>nd</sup> Diagram Right Hand Circle : 7 Square : -15 Bottom Circle : -18	B1 B1 B1	FT from a <u>negative</u> answer in the square
(b)(i) 48 (ii) 8 (iii) 4	B1 B1 B1	Accept embedded answer
	8	

Methods in Mathematics June 2014 Unit 1 Foundation Tier	Mark	Comments
5. Any correct strategy for finding the need for paying for 9 bottles from Len's store AND 8 bottles from Deb's store	S1	
$9 \times 90(p)$ or $8 \times (\pounds)1.00$	M1	Or equivalent
810(p) or (£)8.10 or (£)8	A1	Or equivalent
$810(p) \text{ or } (\pounds)8.10 \text{ AND } (\pounds)8 \text{ AND Deb's store}$	A1	Or equivalent
Look for: Clear process steps and labelling of calculations. Correct use of pounds and pence.		Accept 8.1 for £8.10 If units are given they must be correct
<ul> <li>QWC2: Candidates will be expected to</li> <li>present relevant work clearly, with words explaining process or steps</li> <li>AND</li> <li>make few if any mistakes in spelling, punctuation and grammar</li> </ul>	QWC 2	QWC2 Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar.
<ul> <li>QWC1: Candidates will be expected to</li> <li>present work clearly which is mostly relevant, with words explaining process or steps</li> </ul>		QWC1 Presents material in a coherent and logical manner but with some errors in use of mathematical form, spelling, punctuation or grammar OR
<ul> <li>OR</li> <li>make few if any mistakes in spelling, punctuation and grammar and include units in their final answer</li> </ul>		evident weaknesses in organisation of material but using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar.
	6	QWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, spelling, punctuation or grammar.
6. a) 1/8	B1	penalise once only for consistent use of incorrect
b) 2/8	B1	denominator, provided in a fraction <1
c) 3/8 d) 5/9	B1 B1	penalise once only for incorrect notation
e) 2/8	B1	throughout
f) 2/8	B1	Ignore incorrect cancelling throughout
	6	SC2 for all correct cards for parts c)-f) SC1 for correct cards in 2 or 3 parts from c)-f)
7. a) For 2 correct in a form which allows	B1	
comparison For all 3 correct in a form which allows comparison	B1	
<sup>3</sup> / <sub>4</sub> , 5/8, <sup>1</sup> / <sub>2</sub>	B1	Or equivalent
1. 50/400		Answer only gets B0, B0, B1
b) 50/400 1/8	M1	Or equivalent eg 0.5/4
1/0	5	
8. Appropriate sight of 90(°)	B1	
Appropriate sight 45(°) or 90/2	B1	2 <sup>nd</sup> B1 implies 1 <sup>st</sup> B1
180(°)-45(°) 135(°)	M1	FT 180- 'their 45' provided at least one B1 awarded
	4	An unsupported answer gets full marks

Methods in Mathematics		Mark	Comments
June 2014 Unit 1	Foundation Tier	IVIAI K	
9. (a) $8x$		B1	
(b) $-2a + 9b$		<b>B</b> 2	Must be in an expression, B1 for sight of either
(a) 25		DO	-2a or 9b. Mark final answer. P1 for either 40 or 15
(c) -23 (d) $6rv + 14r$		D2 B2	Must be in an expression B1 for sight of either
$(\mathbf{u}) \ 0 \mathbf{x} \mathbf{y} + 1 4 \mathbf{x}$		D2	fry or 14r
(e) 5a (2b - 5)		B2	B1 for $5a(\dots - 5)$ or $5a(2b - \dots)$ or correct partial
			factorisation
		9	
10 (a)(i) 1 - (0.2 + 0.15 + 0.15)	+ 0.25)	M1	Allow intention of brackets.
0.4		A1	
			(1 - 0.42 =)0.58  gets SC1
			If answer of 0.4 in table and contradicted in
(ii) Red and Yellow		B1	answer space then SC1
(b) $0.3$		B1	FT from their (a)(i) provided it is $\leq 0.2$ and $\neq 0$
(-) • • •		4	
11		B4	B1 for each correct entry
Three times a number c	3 <i>c</i>		
	((z, z, 2))		
Add 3 to a number <i>c</i> and then multiply this total by 6	0(c+3)		
	2		
Three times a number c and then add 6	3c+6		
Add 3 to a number c and then	$\underline{c+3}$		
divide this total by 6	6	4	
12. (a) Square or rectangle	or isosceles trapezium	B1	
(b) Parallelogram or rho (c)(i) $(5, 4)$	mbus or rectangle	BI B1	
(ii) (5, -4)		B1	
		4	
13a) Multiples of 7		B1	
b) 28 and 35 placed corr	rectly	B2	B1 for either
		3	
14. $360 \div 9$	sides	M1	An unsupported answer is awarded M1 A1
$360 \div (180 - 120)$ OR	auivalent full method	M1	e.g. looking at matching a multiple of 180 with a
120, (100 120) OK 0	1 ment fun meniou		multiple of 120:
			180 360 540 720 900
<b>T</b> T 1	1		120 240 360 480 600 720
Y has <b>6</b> si	des		An unsupported answer is awarded M1, A1
15. Interpretation that 36cr	n is 8 parts	51	Or sight of 36÷8 or 36/8 or 4.5
$3 \times 36 \div 8 + 36$ O	R $(3+8) \times 36 \div 8$	M1	Full method to calculate AC. FT their miscalculated
			36÷8, not for 36÷11
49.5(cm) or 49 ½ (cn	n)	Al 3	CAO. Do not accept 50(cm), unless 49.5 seen

Methods in Mathematics June 2014 Unit 1 Foundation Tier				thema	atics tion Tier	Mark	Comments	
16. Cd two-w (Gam (Gam + 1 2 3 4 5	ple: 2 3 4 5 6	ring a ble, or A) 6 1 B) 16 B) 16 C	3         4         5         6         7         8	4         5         6           7         8         9	It comepossibys or oays or oays or o5678910	s, e.g. use of le totals, or utcomes) AND outcomes)	B3	<ul> <li>Accept 6/25 and 16/25. No extra outcomes should be included, e.g. including numbers not on the spinners <i>If card A list complete, accept stopping listing card B possibilities as soon as &gt;6 possible ways indicated correctly.</i></li> <li>B2 for at least 1 possible outcome indicated for each of the 4 numbers on card A AND at least 2 possible outcomes indicated for each of the 4 numbers on card A AND at least 2 possible outcomes for card B.</li> <li>B1 for 1 way of scoring a number on card A AND 2 ways for a number on card B, OR <b>all</b> outcomes for card A.</li> </ul>
Concl	usion,	, game	card I	B has t	he bet	ter chance	E1 4	The conclusion must be based on working, i.e. provided at least B2 previously awarded

# UNIT 1 (HIGHER TIER)

I.a - 52° b = 128° c = 128° d = 40°BI <b< th=""><th>Methods Unit 1 Higher Tier June 2014</th><th>Mark</th><th>Comment</th></b<>	Methods Unit 1 Higher Tier June 2014	Mark	Comment
b = 128° c = 128° d = 40°       B1 B1       FT their b = c FT 92 = their a or their b = 88, or their b = 88, or their c = 88, or 128 - their a         c = 88°       B1         2. Considering all possible outcomes, e.g. use of two way table, or showing all possible totals, or (Game card A) fo possible (ways or outcomes) AND (Game card A) fo possible (ways or outcomes) AND (Game card A) fo possible (ways or outcomes)       B3       Accept 6/25 and 16/25. No extra outcomes should be spinners         Example:       1       2       3       4       5         1       2       3       4       5       6         2. So do 7       8       9       10       B3       Accept 6/25 and 16/25. No extra outcomes should be spinners or card A AND at least 2         1       2       3       4       5       6       7         3. 4       5       6       7       8       9       10         Bossible outcome indicated for each of the 4         a       5       6       7       8       9       10         Conclusion, game card B has the better chance       E1         Look for:       -       clear organisation, ordered lists or tables       -       10 for any wife for any wistakes in mathematical form, spelling, punctuation or grammar.       QWC2       Cand wife for an	1. $a = 52^{\circ}$	B1	
cB1 cB1 FTB1 ber and the ib $h = c$ $a = 40^{\circ}$ B1 cFT 92 - their a or their b $h = 38$ , or their c $h = 88$ , or $128 - their e$ 2. Considering all possible totals, or (Game card A) 6 possible (ways or outcomes) AND (Game card B) 16 possible (ways or outcomes) AND (Game card B) 16 possible (ways or outcomes)B3 Accept 6/25 and 16/25. No extra outcomes should be included, e.g. including numbers not on the spinners. If card A list complete, accept stopping listing card B possibilities as soon as $h > 6$ possible ways indicated correctly.Example:12345 $\frac{1}{2}$ 3456 $\frac{2}{3}$ 456 $\frac{2}{3}$ 45<	$b = 128^{\circ}$	B1	
d = 40°       B1       FT 92 - their a, or their b - 88, or 128 - their e         e = 88°       or their c - 88, or 128 - their e       or their c - 88, or 128 - their e         2. Considering all possible outcomes, e.g. use of two-way table, or showing all possible totals, or       B3         Accept 6/25 and 16/25. No extra outcomes should be included, e.g. including numbers not on the spinners       B3         Example:       B1       E         1       2       3       4       5         1       2       3       4       5         2       3       4       5       6         2       3       4       5       6         2       3       4       5       6       7         3       4       5       6       7       8         5       6       7       8       9       10         Conclusion, game card B has the better chance         Look for:       -       clear organisation, ordered lists or tables       1 be for 1 way of scoring a number on card A AND at least 2 proviously awarded         9       resent work clearly, with words explaining process or steps       QWC2       Presents relevant material in a coherent and logical manner, using acceptable mathematical form, spelling, punctuation or grammar.       QWC1 Presents relev	$c = 128^{\circ}$	B1	FT their $\mathbf{b} = \mathbf{c}$
e = 88°       B1         2. Considering all possible outcomes, e.g. use of two- way table, or showing all possible totals, or (Game card B) 16 possible (ways or outcomes) AND (Game card B) 16 possible (ways or outcomes)       B3         Kample:       1       2       3       4       5         1       2       3       4       5       6         2       3       4       5       6       7         3       4       5       6       7       8         4       5       6       7       8       9         5       6       7       8       9       10         Conclusion, game card B has the better chance         Look for:       -       clear organisation, ordered lists or tables       -         -       labels linking working and game cards       6       10       10         -       clear explanation in a conclusion       7       2         -       clear explanation in a conclusion and grammar and include units in their final answer       0WC2       Present work (clearly, with words explaining process or steps         AND       -       make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer       6         3(a) 18 or equivalent       6	$d = 40^{\circ}$	B1	FT 92 – their a, or their b $-$ 88,
e = 88°       B1         2. Considering all possible outcomes, e.g. use of two- way table, or showing all possible totals, or (Game card A) 6 possible (ways or outcomes) AND (Game card B) 16 possible (ways or outcomes)       B3         Example:       1       2       3       4       5         1       2       3       4       5       6         2       3       4       5       6       7         3       4       5       6       7       8       9       10         B2 for at least 1 possible outcomes indicated for each of the 4 numbers on card A AND at least 2 possible outcomes indicated for each of the 4 numbers on card B, OR all outcomes for card B         Conclusion, game card B has the better chance         Look for:       •       clear organisation, ordered lists or tables       •       labels linking working and game cards       •         •       clear explanation in a conclusion       E1       The conclusion must be based on working, i.e. provided at least B2 previously awarded         QWC2: Candidates will be expected to       •       present work clearly, with words explaining process or steps         QWC1: Candidates will be expected to       •       present work clearly, with words explaining process or steps         QWC1: Candidates will be expected to       •       present work clearly, with words explaining proc			or their $c - 88$ , or $128$ – their e
2. Considering all possible outcomes, e.g. use of two-way table, or showing all possible totals, or (Game card A) 6 possible (ways or outcomes) AND (Game card B) 16 possible (ways or outcomes)       33       Accept 6/25 and 16/25. No extra outcomes should be included, e.g. including numbers on to the spinners. (If card A list complete, accept storping listing card B possibilities as soon as >6 possible ways indicated correctly.         Example:       +       1       2       3       4       5       6       7       8       9       10         B possibilities as soon as >6 possible ways indicated correctly.       B2 for at least 1 possible outcome indicated for each of the 4 numbers on card A AND at each of the 4 numbers on card B. AND at least 1       B2 for at least 1 possible outcome indicated for each of the 4 numbers on card A AND at each of the 4 numbers on card B. OR all outcomes for card B         Conclusion, game card B has the better chance       E1       The conclusion must be based on working, i.e. provided at least B2 previously awarded         Conclusion, game card B has the better chance       E1       The conclusion must be based on working, i.e. provided at least B2 previously awarded         QWC2: Candidates will be expected to       •       resent work clearly, with words explaining process or steps       QWC1 Presents relevant material in a coherent and logical manner but with some errors in use of materiad and errors in use of mathematical form, spelling, punctuation and grammar.         QWC1: Candidates will be expected to       •       present work clearly, with words explaining process or steps </td <td><math>e = 88^{\circ}</math></td> <td>B1</td> <td></td>	$e = 88^{\circ}$	B1	
2. Considering an possible totals, or (Game card A) 6 possible (totals, or (Lotdig and 192-3). You studing and uncomes should be included, e.g. including numbers on on the spinners         Image: I	2 Considering all passible outcomes a grupp of two	) D2	Accort 6/25 and 16/25. No attra outcomes should
Wey how, of shows, of approximation of the function of the functin the function of the function of the function	2. Considering all possible outcomes, e.g. use of two-	<b>D</b> 3	be included e.g. including numbers not on the
(Game card B) 16 possible (ways or outcomes))         Example:         +       1       2       3       4       5         -       2       3       4       5       6         2       3       4       5       6       7       8       9         2       3       4       5       6       7       8       9       10         B2 for at least 1 possible outcome indicated for each of the 4 numbers on card A AND at least 2 possible outcomes indicated for each of the 4 numbers on card B, OR for all possible outcomes indicated for each of the 4 numbers on card B, OR all outcomes for card A         Conclusion, game card B has the better chance       E1       The conclusion must be based on working, i.e. provided at least B2 previously awarded         Look for:       •       clear organisation, ordered lists or tables       •         •       labels linking working and game cards       •       Clear weaknesses       •         •       if used, correct notation for probability       QWC2       Presents relevant material in a coherent and logical manner, using acceptable mathematical form, spelling, punctuation and grammar and include units in their final answer       QWC1 Presents relevant material and errors in use of mathematical form, spelling, punctuation or grammar.         QWC1: Candidates will be expected to       •       present work clearly, with words	(Game card A) 6 possible (ways or outcomes) AND		spinners
Example: $\frac{1}{1}$ $\frac{1}{2}$ $\frac{3}{4}$ $\frac{5}{6}$ $\frac{1}{3}$ $\frac{1}{4}$ $\frac{5}{6}$ $\frac{7}{7}$ $\frac{1}{2}$ $\frac{3}{4}$ $\frac{5}{6}$ $\frac{7}{7}$ $\frac{1}{3}$ $\frac{4}{5}$ $\frac{6}{6}$ $\frac{7}{7}$ $\frac{3}{4}$ $\frac{5}{5}$ $\frac{6}{7}$ $\frac{7}{8}$ $\frac{1}{2}$ $\frac{3}{4}$ $\frac{5}{5}$ $\frac{6}{7}$ $\frac{3}{4}$ $\frac{5}{5}$ $\frac{6}{7}$ $\frac{7}{8}$ $\frac{1}{2}$ $\frac{3}{4}$ $\frac{5}{5}$ $\frac{6}{7}$ $\frac{1}{2}$ $\frac{3}{4}$ $\frac{5}{5}$ $\frac{6}{7}$ $\frac{1}{2}$ $\frac{3}{4}$ $\frac{5}{5}$ $\frac{6}{7}$ $\frac{1}{5}$ $\frac{6}{7}$ $\frac{7}{8}$ $\frac{1}{5}$ $\frac{6}{7}$ $\frac{7}{8}$ $\frac{1}{5}$ $\frac{6}{7}$ $\frac{7}{8}$ $\frac{1}{5}$ $\frac{6}{7}$ $\frac{7}{8}$ $\frac{1}{5}$ $\frac{1}{6}$ $\frac{7}{7}$ $\frac{1}{5}$	(Game card B) 16 possible (ways or outcomes)		If card A list complete, accept stopping listing card
Example:       indicated correctly.         +       1       2       3       4       5         1       2       3       4       5       6       7         3       4       5       6       7       8       9       9         5       6       7       8       9       10       10       Possible outcomes indicated for each of the 4 numbers on card A AND at least 2 possible outcomes indicated for each of the 4 numbers on card B, OR for all possible outcomes for card B         Conclusion, game card B has the better chance       E1       B1 for 1 way of scoring a number on card A AND 2 ways for a number on card B, OR all outcomes for card A         Look for:       -       clear explanation in a conclusion       E1         •       i labels linking working and game cards       QWC         •       clear explanation in a conclusion       2         QWC2: Candidates will be expected to       -       Porsent work clearly, with words explaining process or steps         AND       make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer       0         QWC1: Candidates will be expected to       -       -         •       present work clearly, with words explaining process or steps       -         OR       make few if any mi			$\overset{\circ}{B}$ possibilities as soon as >6 possible ways
I       1       2       3       4       5       6         1       2       3       4       5       6       7         3       4       5       6       7       8       9       10         B2 for at least 1 possible outcomes indicated for each of the 4 numbers on card A AND at least 2 possible outcomes indicated for each of the 4 numbers on card B. OR for all possible outcomes for card B         Conclusion, game card B has the better chance       E1       B1 for I way of scoring a number on card A AND 2 ways for a number on card B. OR all outcomes for card A         Look for:       •       clear organisation, ordered lists or tables       B1 for I way of scoring a number on card A AND 2 ways for a number on card B. OR all outcomes for card A         QWC2: Candidates will be expected to       •       present work clearly, with words explaining process or steps         AND       •       make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer       QWC1 Evident weaknesses in organisation of material but using acceptable mathematical form, spelling, punctuation and grammar and include units in their final answer       6         3.(a) 18 or equivalent       B1       Accept a product of factors       Accept a product of factors         (b) 12 or equivalent       B1       Accept a product of factors       Accept a product of factors       B1      <	Example:		indicated correctly.
1       2       3       4       5       6         2       3       4       5       6       7       8         3       4       5       6       7       8       9       10         Conclusion, game card B has the better chance         Look for:       •       clear organisation, ordered lists or tables       •       1       based on working, i.e. provided at least B2 previously awarded         •       clear explanation in a conclusion       •       clear explanation in a conclusion       •         •       clear explanation in a conclusion       •       clear explanation in a conclusion         •       clear explanation in a conclusion       •       clear explanation in a conclusion         •       resent work clearly, with words explaining process or steps       QWC2       Present work clearly, with words explaining process or steps         AND       •       make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer       6         3.(a) I8 or equivalent       B1       Accept a product of factors         (b) 12 or equivalent       B1       Accept a product of factors         (c) 10       - for eliminating decimals, or correct       B1         Multiplying numerator 0.60(0) or 1 correct s	+ 1 2 3 4 5		
2       3       4       5       6       7         3       4       5       6       7       8       9         4       5       6       7       8       9       10         Conclusion, game card B has the better chance         Look for:       •       clear organisation, ordered lists or tables       •       1 labels linking working and game cards       •       Conclusion must be based on working, i.e. provided at least B2 previously awarded         •       clear organisation, ordered lists or tables       •       Iabels linking working and game cards       •         •       clear explanation in a conclusion       •       2       QWC2       Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation or grammar.         QWC2: Candidates will be expected to       •       Present work clearly, with words explaining process or steps         QWC1: Candidates will be expected to       •       present work clearly, with words explaining process or steps         QWC1: Candidates will be expected to       •       present work clearly, with words explaining process or steps         QWC1: candidates will be expected to       •       •       previaulent         •       present work clearly, with words explaining process or steps       • <td>1 2 3 4 5 6</td> <td></td> <td>B2 for at least 1 possible outcome indicated for</td>	1 2 3 4 5 6		B2 for at least 1 possible outcome indicated for
3       4       5       6       7       8       9         4       5       6       7       8       9       10         Conclusion, game card B has the better chance         Look for:       •       clear organisation, ordered lists or tables       •       labels linking working and game cards       •       clear explanation in a conclusion         •       clear explanation in a conclusion       •       The conclusion must be based on working, i.e. provided at least B2 previously awarded         QWC2: Candidates will be expected to       •       present work clearly, with words explaining process or steps       QWC1       Presents relevant material in a coherent and logical manner, using acceptable mathematical form, spelling, punctuation or grammar.         QWC1: Candidates will be expected to       •       present work clearly, with words explaining process or steps         AND       •       make few if any mistakes in mathematical form, spelling, punctuation and grammar.         QWC1: Candidates will be expected to       •       •         •       present work clearly, with words explaining process or steps       •         OR       •       make few if any mistakes in mathematical form, spelling, punctuation and grammar.       •         0       Present work clearly.       •       •       •         10       <	2 3 4 5 6 7		each of the 4 numbers on card A AND at least 2
Image of the second	3 4 5 6 7 8		numbers on card B OR for all possible outcomes
Image: Solution of the second seco	4 5 6 7 8 9		for card B
Conclusion, game card B has the better chanceB1 for 1 way of scoring a number on card A AND 2 ways for a number on card B, OR all outcomes for card AConclusion, game card B has the better chanceE1Look for: • 	<b>3</b> 0 7 8 9 10		
Conclusion, game card B has the better chance       2 ways for a number on card B, OR all outcomes for card A         Look for:       •         •       clear organisation, ordered lists or tables         •       labels linking working and game cards         •       clear explanation in a conclusion         •       if used, correct notation for probability         QWC2: Candidates will be expected to       0         •       present work clearly, with words explaining process or steps         AND       •         •       make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer         QWC1: Candidates will be expected to       •         •       present work clearly, with words explaining process or steps         OR       •         •       make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer         O(R)       •         •       make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer         3(a) 18 or equivalant       B1         (b) 12 or equivalant       B1         (c) 9       (d) Numerator 0.06(0) or 1 correct step in calculation Multiplying numerator and denominator by suitable multiple of 10 - for eliminating decimals, or correct (FT) evaluation as a decimal <td></td> <td></td> <td>B1 for 1 way of scoring a number on card A AND</td>			B1 for 1 way of scoring a number on card A AND
Conclusion, game card B has the better chance       For card A         Look for:       •         •       clear organisation, ordered lists or tables         •       labels linking working and game cards         •       clear explanation in a conclusion         •       if used, correct notation for probability         QWC2: Candidates will be expected to       2         •       present work clearly, with words explaining process or steps         AND       •         •       make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer         QWC1: Candidates will be expected to       •         •       present work clearly, with words explaining process or steps         OR       •         •       make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer         •       make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer         •       make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer         •       0         •       make few if any mistakes, in calculation (b) 12 or equivalent         •       B1         •       Accept a product of factors			2 ways for a number on card B, OR all outcomes
Conclusion, game card B has the better chance       E1         Look for:       • clear organisation, ordered lists or tables         • labels linking working and game cards       • clear explanation in a conclusion         • clear explanation in a conclusion       QWC         • if used, correct notation for probability       QWC         QWC2: Candidates will be expected to       • present work clearly, with words explaining process or steps         AND       • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer         QWC1: Candidates will be expected to       • present work clearly, with words explaining process or steps         OR       • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer         QWC1: Candidates will be expected to       • present work clearly, with words explaining process or steps         OR       • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer         3.(a) 18 or equivalent       B1         (b) 12 or equivalent       B1         (c) 9       (d) Numerator 0.06(0) or 1 correct step in calculation Huitplying numerator and denominator by suitable multiplying numerator and denominator by suitable multiplying numerator and denominator by suitable multiple of 10 - for eliminating decimals, or correct (FT) evaluation as a decimal       B1         1/1000 <t< td=""><td></td><td></td><td>for card A</td></t<>			for card A
Look for:Ine conclusion must be based on working, i.e. provided at least B2 previously awardedLook for:Ine conclusion must be based on working, i.e. provided at least B2 previously awardedIbleslabels linking working and game cards clear explanation in a conclusionQWC2Iblesif used, correct notation for probabilityQWC2QWC2: Candidates will be expected to process or stepsQWC1 Presents relevant material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar and include units in their final answerQWC1 Presents relevant material in a coherent and logical manner but with some errors in use of mathematical form, spelling, punctuation and grammar and include units in their final answerQWC1 Presents relevant material in a coherent and logical manner but with some errors in use of mathematical form, spelling, punctuation and grammar and include units in their final answerQWC1: Candidates will be expected to • present work clearly, with words explaining process or stepsQWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, spelling, punctuation and grammar and include units in their final answer3.(a) 18 or equivalent (b) 12 or equivalent (c) 9B1 Accept a product of factors Accept a product of factors B1 B1 B1 B1Multiplying numerator and denominator by suitable multiple of 10 - for eliminating decimals, or correct (FT) evaluation as a decimal 1/1000B1Image: Provided B0, B1, B0 (CAO (Example: 0.60/60 = 0.01 or 1/100 or 6/600 is awarded B0, B1, B0 (CAOB1	Conclusion, game card B has the better chance	E1	
Look for:       • clear organisation, ordered lists or tables       • labels linking working and game cards       • clear explanation in a conclusion         • labels linking working and game cards       • clear explanation in a conclusion       • QWC2         • if used, correct notation for probability       2         QWC2: Candidates will be expected to       • present work clearly, with words explaining process or steps         AND       • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer         QWC1: Candidates will be expected to       • present work clearly, with words explaining process or steps         OR       • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer         QWC1: Candidates will be expected to       • present work clearly, with words explaining process or steps         OR       • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer         3.(a) 18 or equivalent       6         (b) 12 or equivalent       B1         (c) 9       B1         Multiplying numerator and denominator by suitable multiple of 10 – for eliminating decimals, or correct (FT) evaluation as a decimal       B1         1/1000       B1         B1       Accept a product of factors         B2       B1         CAO </td <td></td> <td>EI</td> <td>The conclusion must be based on working, i.e.</td>		EI	The conclusion must be based on working, i.e.
<ul> <li>clear organisation, ordered lists or tables</li> <li>labels linking working and game cards</li> <li>clear explanation in a conclusion</li> <li>if used, correct notation for probability</li> <li>QWC2</li> <li>2</li> <li>QWC2: Candidates will be expected to</li> <li>present work clearly, with words explaining process or steps</li> <li>AND</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer</li> <li>QWC1: Candidates will be expected to</li> <li>present work clearly, with words explaining process or steps</li> <li>OR</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer</li> <li>QWC1: Candidates will be expected to</li> <li>present work clearly, with words explaining process or steps</li> <li>OR</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer</li> <li>3.(a) 18 or equivalent</li> <li>(b) 12 or equivalent</li> <li>(c) 9</li> <li>(d) Numerator 0.06(0) or 1 correct step in calculation Multiplying numerator and denominator by suitable multiple of 10 – for eliminating decimals, or correct (FT) evaluation as a decimal</li> <li>1/1000</li> <li>B1</li> <li>CAO</li> <li>CAO</li> <li>(Example: 0.60/60 = 0.01 or 1/100 or 6/600 is awarded B0, B1, B0</li> <li>CAO</li> <li>(Example: 0.60/60 = 0.01 or 1/100 or 6/600 is awarded B0, B1, B0</li> </ul>	Look for:		provided at least B2 previously awarded
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<ul> <li>clear explanation in a conclusion         <ul> <li>if used, correct notation for probability</li> </ul> </li> <li>logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar.</li> <li>QWC2: Candidates will be expected to             <ul></ul></li></ul>	labels linking working and game cards	QWC	OWC2 Presents relevant material in a coherent and
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<ul> <li>present work clearly, with words explaining process or steps</li> <li>AND</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer</li> <li>QWC1: Candidates will be expected to</li> <li>present work clearly, with words explaining process or steps</li> <li>OR</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer</li> <li>3.(a) 18 or equivalent</li> <li>(b) 12 or equivalent</li> <li>(c) 9</li> <li>(d) Numerator 0.06(0) or 1 correct step in calculation Multiplying numerator and denominator by suitable multiple of 10 - for eliminating decimals, or correct (FT) evaluation as a decimal</li> <li>1/1000</li> <li>B1</li> <li>Accept a product of factors</li> <li>B1</li> <li>Accept a product of factors</li> <li>B1</li> <li>B1<td>OWC2: Candidates will be expected to</td><td></td><td></td></li></ul>	OWC2: Candidates will be expected to		
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include units in their final answer       using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar.         QWC1: Candidates will be expected to       using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar.         QWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, spelling, punctuation and grammar and include units in their final answer       6         3.(a) 18 or equivalent       B1         (b) 12 or equivalent       B1         (c) 9       Accept a product of factors         (d) Numerator 0.06(0) or 1 correct step in calculation       B1         Multiplying numerator and denominator by suitable       B1         B1       B1         Multiplying numerator and denominator by suitable       B1         M1/1000       B1         B1       CAO         (FT) evaluation as a decimal       B1         1/1000       B1         B1       CAO         (Example: 0.60/60 = 0.01 or 1/100 or 6/600         is awarded B0, B1, B0         CAO         (Example: 0.60/60 = 0.01 or 1/100 or 6/600         is awarded B0, B1, B0         CAO         (Example: 0.60/60 = 0.01 or 1/100 or 6/600         is awarded B0, B1, B0	form, spelling, punctuation and grammar and		evident weaknesses in organisation of material but
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OR       Indictidit, and cross in use of matchinatical form, spelling, punctuation and grammar and include units in their final answer       spelling, punctuation or grammar.         3.(a) 18 or equivalent       B1       Accept a product of factors         (b) 12 or equivalent       B1       Accept a product of factors         (c) 9       B1       Accept a product of factors         (d) Numerator 0.06(0) or 1 correct step in calculation       B1       B1         Multiplying numerator and denominator by suitable multiple of 10 - for eliminating decimals, or correct       B1       FT depending on their numerator.         (FT) evaluation as a decimal       B1       B1       CAO         1/1000       B1       CAO       CAO         7       60/600 are a 1 <sup>th</sup> stane in gwarded P0       P0	process or steps		weaknesses in organisation of mathematical form
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(a) Financial disorder of the concentration       B1         Multiplying numerator and denominator by suitable multiple of 10 – for eliminating decimals, or correct (FT) evaluation as a decimal       B1         FT depending on their numerator.       B1         Image: 1/1000       B1         Image: 1/1000       B1         CAO       CAO         Image: 1/1000       B1         CAO       CAO         Image: 1/1000       CAO         <	(d) Numerator ().(06(0)) or 1 correct step in calculation	B2 R1	<b>1</b> 101 Signt 01 5, 01 74 $\pm$ 274, 01 0.25 $\pm$ 2.75
multiple of 10       – for eliminating decimals, or correct         (FT) evaluation as a decimal       These 1 <sup>st</sup> 2 B marks are interchangeable         1/1000       A final answer of 0.001 is awarded B1, B1, B0         CAO       CAO         (Example: 0.60/60 = 0.01 or 1/100 or 6/600         is awarded B0, B1, B0         7       60/600 as a 1 <sup>st</sup> stage is granted B0, B0, B0	Multiplying numerator and denominator by suitable	B1	FT depending on their numerator.
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15 awarded BU, BI, BU 7 60/600 as a 1 <sup>st</sup> stage is gwarded D0 D0 D0			(Example: 0.60/60 = 0.01  or  1/100  or  6/600
		7	is uwurueu DU, DI, DU 60/600 as a 1 <sup>st</sup> stage is awarded R0 R0 R0

4. (a) Square or rectangle or isosceles trapezium	B1	
(b) Parallelogram or rhombus or rectangle	B1	
(c)(i)(-5,4)	B1	
(i)(i)(5,-4)	B1	
(II) (3, 4)	4	
5(a) h + 4 - 5a or $5a - 4 h$	P1	FT until 2 <sup>nd</sup> error
3.(a) II + 4 = 5e $0I - 5e = -4 - II$	DI D1	$\begin{bmatrix} r_1 & \text{unu} & 2 & \text{end} \\ (r_2 & Ab & 5 & 1 & \text{end} \\ (r_3 & Ab & 5 & 1 & \text{end} \\ (r_3 & Ab & 5 & 1 & \text{end} \\ (r_3 & Ab & 5 & 1 & \text{end} \\ (r_3 & r_3 & r_3 & r_3 & r_3 & 1 & \text{end} \\ (r_3 & r_3 & r_3 & r_3 & r_3 & r_3 & \text{end} \\ (r_3 & r_3 & r_3 & r_3 & r_3 & r_3 & \text{end} \\ (r_3 & r_3 & r_3 & r_3 & r_3 & r_3 & \text{end} \\ (r_3 & r_3 & r_3 & r_3 & r_3 & r_3 & \text{end} \\ (r_3 & r_3 & r_3 & r_3 & r_3 & r_3 & \text{end} \\ (r_3 & r_3 & r_3 & r_3 & r_3 & r_3 & \text{end} \\ (r_3 & r_3 & r_3 & r_3 & r_3 & r_3 & \text{end} \\ (r_3 & r_3 & r_3 & r_3 & r_3 & r_3 & r_3 & \text{end} \\ (r_3 & r_3 & r_3$
$e = \underline{n+4}$ or $e = \underline{-4-n}$	BI	(e.g. 4n=se leading to 4n/s = e is dwarded B0, B1)
<b>3</b> -3	<b>D</b> 1	
(b) (1) 9	BI	
(ii) 6	B1	
(iii) 3	B1	
	5	
6.(a) False with valid general reason, OR	E2	For example 'false, there is always 1 and the
a correct general statement without selection of false		number itself', or 'false, as they have exactly two
, i i i i i i i i i i i i i i i i i i i		factors'
		E1 for sight of at least 2 prime numbers, with <b>no</b>
		errors in choice of primes and a list of the factors
		of at least 2 prime numbers
		Panalisa incorrect reference to factors
		Choice TRUE but compet con and statement allow
		Choice IRUE but correct general statement allow
(b) True with valid general reason, OR a correct	E2	For example the square root is a factor times by
general statement without selection of true		itself, (other factors are in pairs)'
		E1 for evidence of working with at least 2 square
		numbers, with no errors in choice of square
		numbers leading to
		correct factors
		OR
		• statement of the correct number of
		factors
		OK
		• 1 of each (1 example of factors and 1
		example of number of factors)
	4	Choice FALSE but correct general statement allow
	4	SCI
7. $360 \div 9$	M1	
X has <b>40</b> sides	A1	An unsupported answer is awarded M1, A1
$360 \div (180 - 120)$ OR equivalent full method	M1	
working with interior angles		
Y has <b>6</b> sides	A1	An unsupported answer is awarded M1, A1
	4	, in the second s
8 Interpretation that 36cm is 8 parts	S1	Or sight of $36 \div 8$ or $36/8$ or $4.5$
$3 \times 36 \div 8 + 36$ OR $(3 + 8) \times 36 \div 8$	M1	Full method to calculate $\Delta C$ FT their
$3 \times 30 \cdot 0 + 30$ OK $(3 \pm 0) \times 30 \pm 0$	1411	miscalculated 36: 8 not for 36.11
40.5(cm)  or  40.1/2(cm)	Δ 1	CAO Do not accost 50(cm) unloss 40.5 score
+7.J(UII) 01 47 72 (UIII)	2	CAO. DO HOL ACCEPT JOICHII), UIHESS 49.3 SEEH
	3	
9.(a) 6	<b>B</b> 2	B1 for sight of $4 \times 6$ or $4 \times 2 \times 3$ or $2^{5} \times 3$
		UK for sight of 144. Not for $2 \times 12$ , this is B0
(b) 0.1212 or 0.12	B2	B1 for $0.12$ or $0.12$ or $0.12^{\circ}$ as an answer or seen
		in working
(c) 1/40	B2	B1 for sight of 25/1000 or equivalent unsimplified
	6	fraction

10.(a)(i) 4n + 3	B2	B1 for 4n
(ii) - 2n + 74	B2	B1 for $-2n$ Allow SC1 for $2n + 74$
$(1)^{-211} + 74$ $(11)^{-211} + 74$	D2 D2	D1 for $n^2$ not $an^2$ where $a \neq 1$ OP
(111) 11 – 8	D2	DI IOI II, IIOI AII WIELE $a \neq 1$ , OK
		B1 for sight of second differences 2
(b) $3 \times 20^2 + 4$	M1	Must clearly be $20^2$ not $(3 \times 20)^2$
= 1204	A1	CAO
	8	
$11.(a) 2 \times 10^{10}$	B2	B1 for $20 \times 10^9$ or $0.2 \times 10^{11}$ or similar attempt at
		standard form
		B0 for 20 000 000 000
		B0 101 20 000 000 000
$(1)$ $= 2 - 10^9$	Da	$D_{1} = 10^{8} (5 - 50 - 10) = 72 - 10^{8} = 0.72 - 10^{10}$
(b) $7.3 \times 10^{\circ}$	B2	B1 for 10 ( $5 + 6.8 \times 10$ ) or $7.3 \times 10^{\circ}$ or $0.73 \times 10^{\circ}$
		or similar attempt at standard form
		B0 for 7 300 000 000
		If no marks in (a) & (b) then SC1 for both answers
	4	correct but not in standard form
12 (a) (i) 6x(2x + 3y)	B2	B1 for a correct partially factorised expression OR
12.(a)(1) = 0x(2x + 3y)	02	for sight of $6x(2x)$ or $6x(-2x)$
(1)(-10)(-10)	D1	101 sight of $0x(2x)$ of $0x( + 5y)$
(11)(x + 10)(x - 10)	BI	
(b) $(x + 2)(x - 7)$ (=0)	<b>B</b> 2	B1 for $(x 2)(x 7)$
x = -2 and $x = 7$	B1	Must be from factorised expression or equation
	6	FT from their pair of brackets
13.(a) Explains parallel with intersection v-axis at 3.	E1	Must imply parallel and mention (vertical)
e.g. 'same gradient with intersection at $(y=)3$ '		translation
e.g. suite gradient with intersection at (j )s		Allow 'put the line up another 3 squares'
		Anow put the line up another 5 squares Do not account ' $m=1$ , $a=2$ ' uplose related to $y=y$
		Do not accept $m=1, c=3$ unless related to $y = x$ ,
(b) Reflection (in x-axis) or perpendicular (through the	EI	Accept use of knowledge $m \times -1/m = -1$ , or
origin) or change the sign of the y-coordinate		$m_1 \times m_2 = -1$
		Do not accept 'diagonally downwards', 'opposite
		(direction)', or 'reversed (direction)', or 'swap the
		coordinates'
		Allow 'same but decreasing instead of increasing
		(as it is minus)' 'rotate $90^{\circ}$ (about the origin)'
	2	(as it is initias), fotate 50 (about the origin),
	2	change the sign of one of the coordinates
14.(a) $0.35$ $0.8$ $0.2$ $0.8$ on the correct branches	<b>B</b> 2	B1 for any two correct entries. Accept fractions
(b) $0.65 \times 0.2$	M1	
= 0.13	A1	
	4	
15.(a) Correct region shaded	B1	Union of A and B
(b) Correct region shaded	B1	All shaded except the intersection of A with B
(c) Correct region shaded	B1	All except the non overlap region of $\Delta$
(c) concernegion shuded	3	The except the non-overlap region of T
16	5	The E1 meets dependence the D1 are state
10.		The E1 mark depends on the B1 or sight of a
		correct method.
		For E marks: Do not accept calculation
(a) 37(°)	B1	
Alternate segment theorem <b>and</b> isosceles triangle	E1	Or equivalent.
(b) 55(°)	B1	
(Isosceles triangle.) angle at centre twice angle at	E1	Or equivalent.
circumference	4	
$17 \ 20 \times 70 = 25 \times AC \ OP \ 20 \times (20 + 40) = 25 \times AC$	M1	May be within a calculation towards AR directly
$17.30 \times 70 = 53 \times AC \ OK \ 30 \times (50 + 40) = 35 \times AC$		May be written a calculation towards AD unfectly
AC = 60  (cm)	AI	way be implied in further working
AB = 60 - 35	ml	F1 for their AC provided M1 awarded
= 25 (cm)	A1	
	4	

18.(a)(1) Sketch of $y=x^2$ symmetrical passing through	B1	Mark intention to be symmetrical passing through
the origin		the origin
(ii) Sketch of $y=1/x$ in appropriate 2 quadrants with	B2	B1 for sketch in 1 quadrant with axes as
axes as asymptotes		asymptotes, or for 2 curves appropriately in both
		quadrants but not clearly with intention of axes as
		asumptotos
	DO	
(b) Sketch of $y = 2$ through (0,1), with 1 indicated on	В2	BI for general snape, towards zero gradient for
the y-axis or coordinate (0, 1) given		greater negative values of x, and rising for greater
		positive values of x, clearly through a point on
	5	positive y-axis
19.Substitution of (2, 26),	M1	
e.g. sight of $26 = k \times 2^2 + 3 \times 2$		
k = 5	A1	
Equating $y = 0$ e.g. sight of $0 = kx^2 + 3x$	M1	FT their k with $k \neq 0$ including 'k'
x(5x + 3) = 0	m1	Extracting common factor accent $v(ky \pm 3) = 0$
(0, 0) or $y = 0$	A 1	Extracting containing ratio, accept $x(xx + 3) = 0$ Must be from correct working
(0, 0) of $X = 0(2/5, 0)$ or $y = 2/5$ or equivalents		Accent $x = 2/k$ . Not dependent on m1
(-5/5, 0) or $x = -5/5$ or equivalents	AI	Accept $x = -5/k$ . Not dependent on mit
	6	
20.(a) $(x + 7)^2 + 4$	<b>B</b> 2	B1 for $a = (+)^7$ , B1 for $b = 4$ , only award B2
		for $(x+7)^2 + 4$
(b) Attempt to use common denominator	B1	e.g. allow sight of all 3 fractions denominator 20
		without change to numerators
4(3x+2) - 5(5x-2) + 14 or equivalent	M2	M1 for 2 of the three terms correct.
(20)		May be expressed as separate fractions, or working
		without consideration of the denominator
12x + 8 - 25x + 10 + 14 or equivalent	A1	Convincing step FT from 1 error i e M1
$\frac{12\kappa+6-25\kappa+16+11}{20}$ or equivalent		Must be clearly implying $\pm 10$ term rather than $-10$
20		from notation
		Denemination
22 12	4.1	Denominator must be seen
$=$ $\frac{32-13x}{20}$	AI	Must follow from correct working
20	_	
	1	
21.Sight of $P(A') = 0.6$	B1	
$0.6 \times x = 0.48$ OR $x = 0.48/0.6$	M1	FT their 1 - 0.4 incorrectly evaluated for M1 only,
		do not FT 0.4 for P(A')
x = 0.8	A1	CAO
	3	

### UNIT 2 (FOUNDATION TIER)

Methods in Mathematics June 2014 Unit 2 Foundation Tier	Mark	Comments
1.79	B1	
28	B1	
12	B1	
637	B1	
	4	
2. (a) 8732	B1	
(b) 2387	B1	
(c) 40% and 2/5 and 0.4	B3	B2 for 3 correct and 1 incorrect
		B2 for 2 correct and no more than 1 incorrect
		B1 for 1 correct and no more than 1 incorrect
		B1 for 2 or 3 correct and 2 incorrect
(d) $(\pounds)10-(\pounds)1.53 = (\pounds 8.47)$	M1	
$(\underline{\pounds})10-(\underline{\pounds})1.53$ OR $(\underline{\pounds})8.47$	M1	
7 7		
(£)1.21	Al	CAO
	<b>D0</b>	
(e) <	<b>B</b> 2	D1 for one true connect
>		B1 for any two correct
>	10	
2 (a) C and H	10 D1	A coont transgium
S. (a) C and H	DI D1	Accept trapezium
B and G	DI	Accept nexagon
(b) Radius	B1	
Chord	B1	
Chord	4	
4. (a)		
	B2	B1 for 3 or 4 correct and 1 incorrect
А		OR 3 correct and no incorrect
		B1 for between 5 and 8 shaded to produce a
		symmetrical diagram
B		
(b) 2		
	B1	
	B1	
(c) Enlargement of scale factor 3		
(c) Emargement of scale factor 5	B2	B1 for any two lines correct or 3 points correct
	6	B1 for correct enlargement using different scale
		factor

Methods in Mathematics	Mark	Comments
June 2014 Unit 2 Foundation Tier	Mark	Comments
5. Lisa's ingredients × 10	M1	Or equivalent
2000(g  of flour)  OR 2kg	Δ1	All 3 correct
10 (teaspoons of mustard)		All 5 concer
500(g of butter)		
Neil's ingredients $\times$ 5	M1	Or equivalent Attempt at least one of the three ingredients
5 (teaspoons of salt)	A1	All 3 correct
500(g of cheese)		
1250(ml of milk) OR $1.25 l(itres)$		
Lockform		
LOOK IOI: Correct use of Units		
Labels		
QWC2: Candidates will be expected to	QWC	QWC2 Presents relevant material in a coherent
• present relevant work clearly, with	2	and logical manner, using
words explaining process or steps		acceptable mathematical form, and with few if
AND		any errors in spelling, punctuation and
• make few if any mistakes in spelling,		grammar.
punctuation and grammar		OWC1 D
		QwC1 Presents material in a concret and
QwC1: Candidates will be expected to		mathematical form spelling punctuation or
• present work clearly which is mostly relevant, with words explaining		grammar
process or steps		OR
OR		evident weaknesses in organisation of material
• make few if any mistakes in spelling,		but using acceptable mathematical form, with
punctuation and grammar and include		few if any errors in spelling, punctuation and
units in their final answer		grammar.
		OWC0 Evident weaknesses in organisation of
		material, and errors in use of mathematical
		form, spelling, punctuation or grammar.
	6	
6. (a) 67/100 × 234	M1	Or equivalent
$=(\pounds) 156.78$	A1	
(1) 2/(1) = 2/2	M1	
(b) $2/11 \times 242$ - 44 (g)		Or equivalent
= 44 (g)	AI	
(c) For 2 correct in a form which allows	B1	
comparison	21	
For all 3 correct in a form which allows	B1	Eg 1\4 = 25% = 0.25
comparison		
24%, ¼, 0.3	B1	
	7	
		On a minutant
		Or equivalent Answer only gets B0 B0 B1
		r mower only gets D0, D0, D1

Methods in Mathematics	Mark	Comments
June 2014 Unit 2 Foundation Tier	D 1	
$5 \times 5$	DI M1	
25		
$cm^2$	U1	Independent of other marks
	01	independent of other marks
(b) $(0.6 \times 1.1)/2$ OR $(60 \times 110)/2$	M1	
$0.33(m^2)$	A2	A1 for $3300(\text{cm}^2)$ or $0.66/2$ or $0.3 \times 1.1$ or
		0.6×0.55
(c) $4 \times 4 \times 4$	M1	Alternative method:
$64 (cm^3)$	A1	$4 \times 4$ M1
$64 / (8 \times 4)$ or $32h=64$	M1	$\frac{16}{(cm^2)} \qquad AI$
2 (cm)	AI	16/8 $M1$
(d) $2\pi \times 20$ or $\pi \times 40$	M1	2 (CM) AI
125.6(637  cm)  to  125.7(2  cm)		Accept 126
123.0(037011) to 123.7(2011)	13	
8. (a) x=23	B1	Allow embedded answers in all parts
(b) $x=4$	B1	······································
(c) $y = 72$	B1	
(d) $4a = 39 - 3$	B1	FT 1 error
a = 9	B1	
	5	
9. (a) Listing multiples of 0.3 or 0.4, including	S1	OR listing multiples of 3 or 4 including at least
at least one between 8 and 9.		one between 80 and 90 with the intention to
8.4	<b>B</b> 1	Award S1B1 for unsupported 8.4
	DI	Award STBT for unsupported 8.4
(b) 11.008854	B1	
11.01	B1	
( ) 2000		
(c) 3000	B1	
(d) 0.063	D.	
(u) 0.005	BI	
10 Shana completed accurately with correct	0 D2	With no other 00° rotations shown
rotation seen	<b>D</b> 5	B2 for at least two lines correct in attempting to
		complete the shape with correct rotation of their
		shape with no other 90° rotations shown. OR
		B1 for the shape completed correctly, or a
		correct rotation of the part of the shape given,
	3	ignore other 90° rotations shown
11		Accept embedded answers in part (a)
(a) $18x - 102 = 42$ OR $3x - 17 =$	B1	
42/6	B1 D1	FT from 1 error
18x = 144 $3x = 24$	BI	F1 until 2 error
x=o	M1	No marks for use of "=" unless finally replaced
(b) $9x < 77 - 5$	A1	to give $x < 8$ then award M1 A1
x<8		SC1 for x<82/9 ISW
	M1	
(c) $x + 2x + 3x = 180$	A1	
x=30	A1	
Three angles are $30(^{\circ}), 60(^{\circ}), 90(^{\circ})$		SC1 for the answers of $30(^{\circ})$ , $60(^{\circ})$ and $90(^{\circ})$
		without forming an equation
		SC1 for the answers of $60(\degree)$ , $120(\degree)$ and $180(\degree)$
	8	from equating to 360

Methods in Mathematics June 2014 Unit 2 Foundation Tier	Mark	Comments
12(a) Correct translation	B1	
(b) Correct rotation	B2	B1 near miss of grid lines, or for clockwise 90° about (-2, -1), or for anticlockwise 90° about
(c) Correct reflection in $y = x$	B2	(-1, -2) B1 for a reflection in $y = -x$ , OR for sight of the line $y = x$
	5	
13		
$(x^2 =) 20^2 - 10^2$	M1	
$x^2 = 300$ or $(x =) \sqrt{300}$	A1	x=300 gets M1, A0 unless intention of square
		rooting is shown
(x=) 17(.32 cm)	A1	
	3	

# **UNIT 2 HIGHER**

Methods in Mathematics June 2014 Unit 2 Higher Tier	Mark	Comment
1. Shape completed accurately with correct rotation	B3	With no other 90° rotations shown
seen		B2 for at least two lines correct in attempting to
		complete the shape with correct rotation of their
		shape with no other 90° rotations shown, OR
		B1 for the shape completed correctly, or a correct
		rotation of the part of the shape given, ignore other
	3	90° rotations shown
2.	2.01	Accept embedded answers in parts (a), (b) & (c)
(a) $(x =) 10 \times 8/5$	MI	
x = 16	AI D1	Marla final answer Da nationant 29/7
(b) $(X =) 4$ (c) $18\pi - 102 - 42$ OP $2\pi - 17 - 42/6$	BI D1	T until 2 <sup>nd</sup> arror
(c) $18x - 102 = 42$ OK $5x - 17 = 42/0$	DI R1	
16x = 144 $5x = 24$ or $x = 24/5$	B1	
(d) $9x < 77 = 5$	M1	No marks for use of "=" unless finally replaced to
x<8	Al	give $x < 8$ then award M1 A1
		SC1 for $x < 82/9$ ISW
(e) $x < 85/5$ or $x < 17$	M1	Or sight of $5 \times 16 = 80$ with $5 \times 17 = 85$
16	Al	Accept unsupported 16, or a unique answer of 16
		from a trial and improvement method. Do not
		accept x<16.
		SC1 for sight of $5x = 85$ , $x = 17$ followed by
	10	selecting $x = 16$
$3(a) 100 \times 34 / 6800 \text{ or } 100 \times 34 \div 6800$	M1	
$0.5(\%)$ or $\frac{1}{2}(\%)$	A1	
(b) $1.0225 \times 34000$ or $34000 + 34000 \times 2.25 / 100$	M1	Accept 0.25 written as <sup>1</sup> / <sub>4</sub>
or 102.25 × 34000/100		
34765	Al	
$(-) 0.2(-)1245 = \pi^{3}(-)(00) = \pi^{0} 0.45 + 2(00) = \pi^{-1} = \pi^{-1}$	MI	
$(c) 0.20 \times 1345 \text{ of } \frac{9}{8} \times 600 \text{ or } 0.045 \times 3600 \text{ or equivalent}$		Any one correct calculation shown
225 (m)		Accept 349 01 350
162 (m)		Accept 160
160 230 350	B1	Must all be 2 significant figures
100 200 000	21	FT provided at least 2 of the A marks awarded
(d) $450 \times 4 \div 9$	M1	Complete method
= 200	A1	CAO
$450  imes 4 \div 5$	M1	Complete method
= 360	A1	CAO
Difference 160	A1	Depend on both M marks
	14	

Methods in Mathematics June 2014 Unit 2 Higher Tier	Mark	Comment
4.(Area of faces are) $2e \times 3e$ , $2e \times 4e$ , $3e \times 4e$ , $(cm^2)$ $(2e \times 3e, 2e \times 4e, 3e \times 4e)$ $(cm^2)$	M2	M1 for any one of the 3 unique expressions These marks may be implied by correct simplified expressions
(Simplified equation for the total surface area is) $52e^2 = 468$	A2	FT for M2 or M1 as appropriate, provided their simplified sum includes at least two of the expressions $6e^2$ , $8e^2$ , $12e^2$ and all three terms in the form $ae^2$ . A1 for $(2 \times) [6e^2 + 8e^2 + 12e^2]$ OR $52e^2$ (cm <sup>2</sup> ) A1 for $ae^2 = 468$
$e^2 = 468/52  (=9)$ e = 3	B1 B1	FT 'their equation' if in the form $ae^2 = 468$ FT 'their equation' if in the form $ae^2 = 468$
(Volume = $6 \times 9 \times 12$ =) 648 (cm <sup>3</sup> )	B1	FT 'their e' within $24 \times e^3$ correctly evaluated
Look for: if units given, are they correct? notation labels and joining text	QWC 2	If no marks, then allow SC2 for $3e \times 4e \times 2e = 468$ leading to an answer of $e = 2.69$ or 2.7, or SC1 for sight of $3e \times 4e \times 2e = 468$ or equivalent QWC2 Presents relevant material in a coherent and logical manner using acceptable mathematical
QWC2: Candidates will be expected to • present work clearly, with words explaining		form, and with few if any errors in spelling, punctuation and grammar.
<ul> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer</li> </ul>		QWC1 Presents relevant material in a coherent and logical manner but with some errors in use of mathematical form, spelling, punctuation or grammar OR
QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps		using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar.
<ul> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer</li> </ul>	9	QWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, spelling, punctuation or grammar.
5. $26.5 - 26.5 \times 0.12$ OR $26.5 \times 0.88$ (=23.3(2)	M1	OR M2 for
23.3(2) – 23.3(2) × 0.08 OR 23.3(2) × 0.92 (= 21.4544 or 21.436)	M1	$26.5 \times 0.88 \times 0.92$ FT 'their 23.32', but not 26.5
25.3 – 21.4544 (= 3.8456) OR 25.3 – 21.436(=3.864)	m1	Depends on both previous M marks FT for their 23(.32) and their 21()
$3.8(^{\circ}C)$ to $3.9(^{\circ}C)$ from correct working	A1 4	Accept 4(°C) from correct working
6. Sight of any quotient using values from the table for a/b or b/a	M1	Or sight of 1 correct response, or answers reversed
$a = 2.5 \times b$ $b = 0.4 \times a$	A1 A1 3	Or equivalent Or equivalent FT from $a = 0.4 \times b$ to give $b = 2.5 \times a$
7.(a) $5.6 \times 10^{-5}$ (b) $2.3 \times 10^{9}$	B1 B1 2	

Methods in Mathematics	Mark	Comment
8 Idea to show or use the perpendicular height in a	<u>S1</u>	Award for statement such as '6(cm) is not the
right angled triangle	51	vertical height'
Height = $\sin 58^\circ \times 6$	M2	M1 for $\sin 58^\circ = \text{Height}/6$
= 5(.088  cm)	A1	
$Area = 5(.088) \times 10$	M1	FT their 5(.088cm) provided prior M1 awarded
		or an attempt has been made to use a trig ratio
$= 50.9 (cm^2) \text{ or } 51 (cm^2)$	A1	Must be rounded. Do not accept 50.8 or 50 (from
		premature approximation). FT from M1
		If S1 only, then use of spurious perpendicular
		height <6, then also award SC1 for their
		perpendicular height $\times 10$ correctly evaluated
		Alternative:
		Use of ½ absinC S1
		$2 \times \frac{1}{2} \times 6 \times 10 \times \sin 58^{\circ}$ M3
		or M2 for $\frac{1}{2} \times 6 \times 10 \times \sin 58^{\circ}$
		$50.9(cm^2) \text{ or } 51(cm^2)$ A2
	6	or A1 for calculating 1/2 required area
9(a) Correct translation	B1	
(b) Correct rotation	B2	B1 near miss of grid lines or for clockwise 90°
		about $(-2, -1)$ or for anticlockwise 90° about
		(-1, -2)
(c) Correct reflection in $y = x$	B2	B1 for a reflection in $v = -x$ .
		OR for sight of the line $v = x$
(d) Enlargement scale factor <sup>1</sup> / <sub>2</sub>	B2	B1 for any 1 line correct, or consistent incorrect
		fractional scale
Correct position	B1	
	8	
10. 26.7 = $\Pi \times d$ or 26.7 = $2 \times \Pi \times r$ or $r = 26.7/\Pi$	M1	
Diagonal = $8.495$ to $8.5(0)$ (cm)	A1	Accept rounded or truncated
$diagonal^2 = side^2 + side^2$	M1	FT their diagonal
$side^2 = diagonal^2/2$	Al	
side length = $6(.0096cm)$	AI	Do not FT from inappropriate truncation or
		incorrect rounding (e.g. from $d = 8.4$ )
$P_{\text{entropy}} = 24$ ( , , , , , )	D1	The movided both M more a guarded for 4x 'their
Perimeter = 24.(cm)	6	side length'
11 (a)(i) $y = x$ and $y = -x$ indicated	B2	B1 for either indicated in 2 quadrants or both
(2  quadrants for both)	D2	indicated in 1 quadrant each
(- quantante for cour)		B1 for indication of appropriate points at least 3 in
		each of the 4 quadrants
		Ignore any circles drawn
(ii) $y = x$ and $y = -x$ or equivalent	B2	CAO. B1 for either equation
(b) $x^2 + y^2 = 3^2$ or $x^2 + y^2 = 9$	B1 5	CAO
$12. \sin XYZ/23.8 = \sin 123(^{\circ})/38.9$	M1	OR 23.8/sin XYZ = $38.9/sin123(^{\circ})$
$\sin XYZ = 23.8 \times \sin 123(^{\circ})/38.9$	M1	OR $\sin^{-1} 0.513$ This M1 implies previous M1
XYZ = 30.871. (°) rounded or truncated correctly	A1	
The solution of the solution o	3	

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13. $y = 4 - x$ OR $x = 4 - y$	MI	OR For sight of $x^2 + xy = 4x$
$2x^{2} + x(4-x) - 5 = 0 \qquad 2(4-y)^{2} + (4-y)y - 5 = 0$	M1	OR Subtraction from 1 <sup>st</sup> equation
$x^2 + 4x - 5 = 0 \qquad \qquad y^2 - 12y + 27 = 0$	A1	$OR  x^2 + 4x = 5$
(x - 1)(x+5) = 0 $(y - 3)(y - 9) = 0$	M1	FT provided quadratic from an appropriate
		substitution method or subtraction method
		OP alternative method to solve a g formula with
		or alternative method to solve, e.g. formula with $a_{a}$
	A 1	correct substitution and b -4ac correctly simplified
x = 1, x = -5 OR $y = 5, y = 9$	AI	
y = 3, y = 9 $x = 1, x = -5$	AI	
		If A0, A0 then SC1 for $x = 1$ , $y = 3$ OR $x = -5$ , $y = 9$
		provided algebraic method shown with
		appropriate M1, M1, M1 marks
	6	No marks for trial & improvement methods
14(a) 6:2 and 7:QR or equivalent, or scale factor 7/6	B1	OR 6:8 and 7: <b>PR</b> or equivalent
$OR = 2 \times 7 \div 6$ or equivalent	M1	OR <b>PR</b> = $7 \times 8 \div 6$ (= 9.33) or equivalent
OR = 23(33  cm)	A1	
(b) $AE - Ax$	B1	
AE = 55  M	B1	
$A\Gamma = 3.5 \text{ y}$ (Designator =) $E_{\text{W}} + 9.5 \text{ y}$ or $E_{\text{W}} + 17 \text{ y}/2$ IEW	B1	CAO Must be simplified
(Perimeter =) 0x + 8.5y 0r 0x + 1/y/2 15 w	DI	CAO. Must be simplified $A = (1/(12) + 17)$
	6	Accept $\frac{1}{2}(12x + 1/y)$
	0	Answers of $4x + 5.5y + 2x + 3y$ imply B1, B1, B0
15. $b = 45(^{\circ})$	BI	
$c = 180(^{\circ})$	BI	
	2	
16(a) <b>HK</b> = <b>HL</b> + <b>LK</b> (= 5 <b>x</b> + 6 <b>y</b> + 3 <b>x</b> - 6 <b>y</b> )	M1	
$= 8\mathbf{x} (+0\mathbf{y})$	A1	
(b)(i) $LN = 3x - 6y + 18x - 36y (=21x - 42y)$	M1	
k = 7	A1	May be embedded. Award M1, A1 for sight of
		k=7
(ii) Collinear (or lie along the same straight line)	B1	Do not accept parallel as a full description
	5	
17. Area of the square base = $119.8 - 4 \times 23.6$	M1	
$= 25.4 (\text{cm}^2)$	A1	
(Volume pyramid) $76.4 = \frac{1}{3} \times 25.4 \times \text{height}$	m1	FT their area of square base
		Note $\sqrt{25.4} = 5.0398 \times 5.0398$
height = $9.02$ cm	A1*	
(Volume cone) $44.4 = \frac{1}{3} \times \pi \times r^2 \times height$	M1*	Depends on all previous method marks, FT their
		height
$r^2 = 44.4/(\frac{1}{3} \times \pi \times \text{height})$	M1	FT equivalent difficulty, isolating $r^2$
	A1	CAO.
$r^{2} = (44.4 \times \frac{1}{3} \times 25.4) / (76.4 \times \frac{1}{3} \times \pi)$		OR $r^2 = 4.7$ or an appropriate unrounded r r -
$r^2 = 4.69$ to $4.701$		2.1681875 to $2.17$
(radius) 2 17  or  2 2 (cm)	Δ1	CAO
	111	Appropriate degree of accuracy required
		Appropriate degree of accuracy required
		Alternative for A1* M1*
		Fauating heights
		$76 \Lambda / (1/2 \times 25 \Lambda) - \Lambda \Lambda / (1/2 \times -2^{2})$
		$(0.4) (/3 \land 25.4) = 44.4 / (73 \land 11 \land 11)$
		For information :
		Common height = 0.02(cm)
	0	$U_{\text{tight}} = 9.02(\text{cm})$
	ð	пеіgnt of a triangular face = 9.3/(ст)

### UNIT 2 (HIGHER TIER)

	1	
Methods in Mathematics Unit 2 Higher Tier June 2014	Mark	Comment
1. Shape completed accurately with correct rotation	B3	With no other 90° rotations shown
seen		B2 for at least two lines correct in attempting to
		complete the shape with correct rotation of their
		shape with no other $90^{\circ}$ rotations shown. OR
		B1 for the shape completed correctly, or a correct
		rotation of the part of the shape given ignore other
	3	90° rotations shown
2.		Accept embedded answers in parts (a), (b) & (c)
(a) $(x =) 10 \times 8/5$	M1	
x = 16	A1	
(b) $(x =) 4$	B1	Mark final answer. Do not accept 28/7
(c) $18x - 102 = 42$ OR $3x - 17 = 42/6$	B1	FT until 2 <sup>nd</sup> error
18x = 144 $3x = 24$ or $x = 24/3$	B1	
x=8	B1	
(d) $9x < 77 - 5$	M1	No marks for use of "=" unless finally replaced to
x<8	A1	give $x < 8$ then award M1 A1
		SC1 for $x < 82/9$ ISW
(e) $x < 85/5$ or $x < 17$	M1	Or sight of $5 \times 16 = 80$ with $5 \times 17 = 85$
16		Accept unsupported 16 or a unique answer of 16
	711	from a trial and improvement method. Do not
		accept x<16.
		SCI for sight of $5x = 85$ , $x = 17$ followed by
	10	selecting $x = 16$
$3(a) 100 \times 34 / 6800$ or $100 \times 34 \div 6800$	M1	
0.5(%) or $1/6(%)$		
(b) $1.0225 \times 34000$ or $34000 + 34000 \times 2.25/100$	M1	Accept 0.25 written as $\frac{1}{4}$
or 102 25 × 34000/100	1411	Accept 0.25 whiteh as 74
34765	A 1	
57705	711	
(c) $0.26 \times 1345$ or $\frac{3}{8} \times 600$ or $0.045 \times 3600$ or equivalent	M1	Any one correct calculation shown
349.7 (m)	Al	Accept 349 or 350
225 (m)	A1	Accept 230
162 (m)	Al	Accept 160
160 230 350	B1	Must all be 2 significant figures
		FT provided at least 2 of the A marks awarded
		1
(d) $450 \times 4 \div 9$	M1	Complete method
= 200	A1	CAO
$450  imes 4 \div 5$	M1	Complete method
= 360	A1	CAO
Difference 160	A1	Depend on both M marks
	14	

Methods in Mathematics Unit 2 Higher Tier June 2014	Mark	Comment
4.(Area of faces are) $2e \times 3e$ , $2e \times 4e$ , $3e \times 4e$ , $(cm^2)$ $(2e \times 3e, 2e \times 4e, 3e \times 4e)$ $(cm^2)$	M2	M1 for any one of the 3 unique expressions These marks may be implied by correct simplified expressions
(Simplified equation for the total surface area is) $52e^2 = 468$	A2	FT for M2 or M1 as appropriate, provided their simplified sum includes at least two of the expressions $6e^2$ , $8e^2$ , $12e^2$ and all three terms in the form $ae^2$ . A1 for $(2 \times) [6e^2 + 8e^2 + 12e^2]$ OR $52e^2$ (cm <sup>2</sup> ) A1 for $ae^2 = 468$
$e^2 = 468/52  (=9)$ e = 3	B1 B1	FT 'their equation' if in the form $ae^2 = 468$ FT 'their equation' if in the form $ae^2 = 468$
(Volume = $6 \times 9 \times 12$ =) 648 (cm <sup>3</sup> )	B1	FT 'their e' within $24 \times e^3$ correctly evaluated
Look for: if units given, are they correct? notation labels and joining text	QWC 2	If no marks, then allow SC2 for $3e \times 4e \times 2e = 468$ leading to an answer of $e = 2.69$ or 2.7, or SC1 for sight of $3e \times 4e \times 2e = 468$ or equivalent QWC2 Presents relevant material in a coherent and
QWC2: Candidates will be expected to • present work clearly, with words explaining process or steps		logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar.
<ul> <li>AND</li> <li>make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer</li> </ul>		QWC1 Presents relevant material in a coherent and logical manner but with some errors in use of mathematical form, spelling, punctuation or grammar OR
QWC1: Candidates will be expected to • present work clearly, with words explaining process or steps		evident weaknesses in organisation of material but using acceptable mathematical form, with few if any errors in spelling, punctuation and grammar.
<ul> <li>Make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer</li> </ul>	9	QWC0 Evident weaknesses in organisation of material, and errors in use of mathematical form, spelling, punctuation or grammar.
5. $26.5 - 26.5 \times 0.12$ OR $26.5 \times 0.88$ (=23.3(2)	M1	OR M2 for
23.3(2) – 23.3(2) × 0.08 OR 23.3(2) × 0.92 (= 21.4544 or 21.436)	M1	$26.5 \times 0.88 \times 0.92$ FT 'their 23.32', but not 26.5
25.3 - 21.4544 (= 3.8456) OR 25.3 - 21.436(=3.864)	m1	Depends on both previous M marks FT for their 23(.32) and their 21()
$3.8(^{\circ}C)$ to $3.9(^{\circ}C)$ from correct working	A1 4	Accept 4(°C) from correct working
6. Sight of any quotient using values from the table for a/b or b/a	M1	Or sight of 1 correct response, or answers reversed
$\begin{array}{l} \mathbf{a} = 2.5 \times \mathbf{b} \\ \mathbf{b} = 0.4 \times \mathbf{a} \end{array}$	A1 A1 3	Or equivalent Or equivalent FT from $a = 0.4 \times b$ to give $b = 2.5 \times a$
7.(a) $5.6 \times 10^{-5}$ (b) $2.3 \times 10^{9}$	B1 B1 2	

8. Idea to show a basine and the perpendicular height in a right angled mixed in a strain basine of the statement such as '6(cm) is not the serical height' M1 for sinf88 = Height'6 Area = 5(.088m) = 50.9(cm <sup>2</sup> ) or 51(cm <sup>2</sup> ) = 6 or Al for calculating the required area = 74 for or calculating the required area = 6 or Al for calculating the required area = 6 or Al for calculating the required area = 11 for a reflection in y = x. = 12 for a reflection in y = x. = 12 for a reflection in y = x. = 11 for a reflection in y = x. = 11 for a reflection in y = x. = 12 for a	Methods in Mathematics Unit 2 Higher Tier June 2014	Mark	Comment
right angled triangle Hight = sin58 × 6 = 5(0.88,) × 10 = 50.9(cm <sup>2</sup> ) or 51(cm <sup>2</sup> ) = 50.9(cm <sup>2</sup> ) or 51(cm <sup>2</sup> ) or 51(cm <sup>2</sup> ) or 71 or anticlockwise 90° = 50.9(cm <sup>2</sup> ) or 51(cm <sup>2</sup> ) or 71 or anticlockwise 90° = 50.9(cm <sup>2</sup> ) or 71 or an	8. Idea to show or use the perpendicular height in a	S1	Award for statement such as '6(cm) is not the
Height = sin S8" × 6 = 5(.088m) provided prior M1 awarded or an attempt has beem rade to use a trig ratio or an attempt has beem rade to use a trig ratio or an attempt has beem rade to use a trig ratio must be rounded. Do not accept 50.8 of 00 from premature approximation, JT from M1 HT their 5(.088m) provided prior M1 awarded or an attempt has beem rade to use a trig ratio Must be rounded. Do not accept 50.8 of 00 from premature approximation, JT from M1 HT of model. Do not accept 50.8 of 00 from premature approximation, JT from M1 HT of model. Do not accept 50.8 of 00 from premature approximation, JT from M1 HT of model. Do not accept 50.8 of 00 from premature approximation, JT from M1 HT of model. Do not accept 50.8 of 00 from theight < 0.1 metabolic approximation, JT from M1 HT of model. Do not accept 50.8 of 00 from theight < 0.1 metabolic approximation, JT from M1 HT their dispont = 1.0 not for anticocharise 90° about (-1, -2).9(a) Correct translationB1(b) Correct rotationB2(c) Correct reflection in $y = x$ (d) Enlargement scale factor ½B2B1 for a reflection in $y = x$ , (d) Enlargement scale factor ½B2B1 for a reflection in $y = -x$ , (OR for sight of the line $y = x$ B1 for any line correct, or consistent incorrect fractional scale10. 26.7 = 11× d or 26.7 = 2×11× r or r = 26.7/11 M1 aide = langena1².2M1 A1 A1 Accept rounded or truncated HT their diagonal side = langen1².211. [0. 26.7 = 11× d or 26.7 = 2×11× r or r = 26.7/11 A1 aide = langena1².2M1 A1 A1 A1 Accept rounded or truncated HT their diagonal side = langena1².212. (i) $2.67.7 = 12×11× r or r = 26.7/11A1bigger= 4.51.0001 contor to a 0.01FT provided bo$	right angled triangle		vertical height'
$ \begin{array}{c} = 5(0.88m) \\ Area = 5(0.88m) \\ Area = 5(0.88m) \\ = 50.9(cm2) or 51(cm2) \\ \end{array} \\ \begin{array}{c} FT their 5(0.88cm) provided prior M1 awarded or an attempt has been made to use at transition for the set of surface products of the set of the$	Height = $\sin 58^\circ \times 6$	M2	M1 for $\sin 58^\circ = \text{Height}/6$
Area = 3(0.88) × 10YIPT inder 3(0.88) provided prior VII standard or an attempt has been made to use a trig ratio or an attempt has been made to use a trig ratio man tempt has been made to use a trig ratio Must be rounded. Do not accept 50.8 or 50 (form prenature approximation). PT from MI If SI only, then use of spurious perpendicular height < 50 hen acts avard 250 (form in perpendicular height × 10 correctly evaluated Alternative: Use of Y absint C0AltAlt0Normet TotalionBl0Correct translationBl0Correct rotationBl0Correct reflection in y = xBl near miss of grid lines, or for clockwise 90° about (< 2, -1), or for anticlockwise 90° about (< 1, -2)	= 5(.088cm)	Al M1	ET their 5(000 cm) and ideal arise M1 counded
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Area = $5(.088) \times 10$ = $50.9(cm^2)$ or $51(cm^2)$		F1 their 5(.088cm) provided prior M1 awarded or an attempt has been made to use a trig ratio Must be rounded. Do not accent 50.8 or 50 (from
If S1 only, then use of spatnings performance of spatnings performance of the spatning SC for their perpendicular height ×10 correctly evaluatedAlternative: Use of Y achin CSI 2 × ½ × 6 × 10 × sin 58° S0 (cm? or 51(cm²))9(a) Correct translationB1(b) Correct rotationB1(c) Correct reflection in $y = x$ (d) Enlargement scale factor ½ Correct positionB2 B1 B110. 26.7 = 11×d or 26.7 = 2 × 11× r or $r = 26.711$ (d) Enlargement scale factor ½ Correct positionB2 B1 B1 For anticlockwise 90° about (-1, -2)10. 26.7 = 11×d or 26.7 = 2 × 11× r or $r = 26.711$ (d) Enlargement scale factor ½ B2M1 Accept rounded or truncated FT their diagonal side '= side' = side' side '= side' = side' Side '= diagonal²2 Side '= side' = side' = side '= side' Side '= diagonal²2 Side '= side' = side '= side' Side '= diagonal²2 Side '= diagonal²2 Side '= side' = side' Side '= diagonal²2 Side '= side' = side' Side '= diagonal²2 Side '= side' = side' Side '= side' = side' = side '= side' Side '= diagonal?11. (a)(i) $y = x$ and $y = -x$ indicated (2 quadrants for both) Si $y = x and y = -x indicated(2 quadrants for both)12. in XYZ = 23.8 sin 123(°)(38.9 Minon' 0.8 11 for either indicated in 2 quadrants, or bothindicated in 1 quadrant eachB1 for indication 6 appropriate points at least 3 ineach of the 4 quadrants(R is in' 0.513 This M1 implies previous M1XYZ = 30.871(?) rounded or truncated correctlyX^2 + 4x - 5 = 0X^2 + 12y + 27 = 013. y = 4$	= 50.7(cm ) or 51(cm )	AI	premature approximation). FT from M1
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $			If S1 only, then use of spurious perpendicular
Alternative: Use of Y absin C was of Y absin C W 2 for Y > 6 + 10 × sin 58" M3 or M2 for Y > 6 + 10 × sin 58" M3 or M2 for Y > 6 + 10 × sin 58" M3 or A1 for calculating Y required area9(a) Correct translationB1(b) Correct rotationB29(a) Correct reflection in y = x (d) Enlargement scale factor Y2 Diagonal = 8.495 to 8.50) (cm)B110. 26.7 = 11 × d or 26.7 = 2 × 11× r or r = 26.711 Jagonal = 8.495 to 8.50) (cm)M1 A R10. 26.7 = 11× d or 26.7 = 2 × 11× r or r = 26.711 Jagonal = 8.495 to 8.50) (cm)M1 A A A A tide' = diagonal?2 A1 B111. (a)(i) y = x and y = - x (ii) y = x and y = - x (iii) y = x and y = - xB1 A Correct positionB1In carrel was and y = - x (iii) y = x and y = - x(iii) y = x and y = - x 			perpendicular height ×10 correctly evaluated
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $			Alternative:
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $			Use of ½ absinC S1
or M2 for $l_2^{s} < 5 < l0 > sin 58^{s}$ 9(a) Correct translationB1(b) Correct rotationB1(c) Correct reflection in $y = x$ (d) Enlargement scale factor $l_2$ (e) Correct position(f) $2 = 1 \times d$ or $26.7 = 2 \times \Pi \times r$ or $r = 26.7/\Pi$ (f) $2 = 1 \times d$ or $26.7 = 2 \times \Pi \times r$ or $r = 26.7/\Pi$ (h) $2 = 1 \times d$ or $26.7 = 2 \times \Pi \times r$ or $r = 26.7/\Pi$ (h) $2 = 1 \times d = s ade^2 + s ade^2$ (h) $2 = 1 \times d = s ade^2 + s ade^2$ (h) $2 = 1 \times d = s ade^2 + s ade^2$ (h) $2 = 1 \times d = s ade^2 + s ade^2$ (h) $2 = 1 \times d = s ade^2 + s ade^2$ (h) $2 = 1 \times d = s ade^2 + s ade^2$ (h) $2 = 1 \times d = s ade^2 + s ade^2$ (h) $2 = 1 \times d = s ade^2 + s ade^2$ (h) $2 = 1 \times d = s ade^2 + s ade^2$ (h) $2 = 1 \times d = s ade^2 + s ade^2$ (h) $2 = 1 \times d = s ade^2 + s ade^2$ (h) $2 = 1 \times d = s ade^2 + s ade^2$ (h) $2 = 1 \times d = s ade^2 + s ade^2$ (h) $2 = 1 \times d = s ade^2 + s ade^2$ (h) $2 = 1 \times d = s ade^2 + s ade^2$ (h) $2 = 1 \times d = s ade^2 + s ade^2$ (h) $2 = 1 \times d = s ade^2 + s a$			$2 \times \frac{1}{2} \times 6 \times 10 \times \sin 58^{\circ} \qquad M3$
SolutionSolutionA29(a) Correct translationB1(b) Correct rotationB2(c) Correct reflection in $y = x$ B2(d) Enlargement scale factor $V_2$ B1(d) Enlargement scale factor $V_2$ B1(d) Enlargement scale factor $V_2$ B1Correct positionB110. 26.7 = $\Pi \times d$ or $26.7 = 2 \times \Pi \times r$ or $r = 26.7/\Pi$ M1Accept rounded or truncateddiagonal <sup>2</sup> = $3495$ to $850$ ) (cm)side <sup>2</sup> = diagonal <sup>2</sup> /2side length = $6.0096$ cm)Perimeter = $24cm$ )B111.(a)(i) $y = x$ and $y = -x$ indicated(2 quadrants for both)(ii) $y = x$ and $y = -x$ or equivalent(b) $x^2 + y^2 = 3^2$ or $x^2 + y^2 = 9$ B1CAO12. $xin XYZ/23.8 = sin123(°)/38.9$ (ii) $y = x$ and $y = -x$ or equivalent(b) $x^2 + y^2 = 3^2$ or $x^2 + y^2 = 9$ B1CAO13. $y = 4 - x$ OR $x = 4 - y$ $x^2 + 4x - 5 = 0$ $y^2 - 12y + 27 = 0$ (x - 1)(x+5) = 0(y - 3)(y - 9) = 0x^2 + 4x = 5(x - 1)(x+5) = 0(y - 3)(y - 9) = 0x - 1, x = -5(x - 1)(x+5) = 0(y - 3)(y - 9) = 0x - 1, x = -5(x - 1)(x+5) = 0(y - 3)(y - 9) = 0x - 1, x = -5(x - 1)(x+5) = 0(y - 3)(y - 9) = 0x - 1, x = -5(x - 1)(x+5) =			or M2 for $\frac{1}{2} \times 6 \times 10 \times \sin 58^{\circ}$
9(a) Correct translation007 At for Cultulating 2/ required area9(a) Correct translationB1(b) Correct rotationB2(c) Correct reflection in $y = x$ B1 near miss of grid lines, or for clockwise 90° about $(-1, -2)$ (d) Enlargement scale factor $\frac{1}{2}$ B2B1B1 near miss of grid lines, or for clockwise 90° about $(-1, -2)$ (d) Enlargement scale factor $\frac{1}{2}$ B2B1B1 rear areflection in $y = -x$ ,(d) Enlargement scale factor $\frac{1}{2}$ B1Correct positionB1B1Accept rounded or truncatedfractional $^2 = side^2 + side^2$ side $^2 = diagonal^2/2$ aside length = 6(.0096em)B1Perimeter = 24.(em)B1B1B1(ii) $y = x$ and $y = - x$ indicated(2 quadrants for both)B1(iii) $y = x$ and $y = -x$ or equivalent(b) $x^2 + y^2 = 3^2$ or $x^2 + y^2 = 9$ B1CAOB1B1B2B3B3B4B4B4B5B6B7B7B8B9B9B1B1B2B3B4B4B5B6B6B7B8B9B9B1B2		6	$50.9(cm^2)$ or $51(cm^2)$ A2
(b) Correct rotationB2B1 near miss of grid lines, or for clockwise 90° about (-2, -1), or for anticlockwise 90° about (-1, -2)(c) Correct reflection in $y = x$ B2B1 for a reflection in $y = -x$ , OR for sight of the line $y = x$ (d) Enlargement scale factor ½B2(d) Enlargement scale factor ½B2(e) Correct positionB110. $26.7 = 10 \times dor 26.7 = 2 \times   X \times   or   r = 26.7/  M1Diagonal = 8.495 to 8.5(0) (cm)A1side length = 6(.096cm)A1side length = 6(.096cm)A1Perimeter = 24.(cm)B111.(a)(i) y = x and y = -x indicated(i) y = x and y = -x indicated(ii) y = x and y = -x or equivalent(iii) y = x and y = -x or equivalent(b) x^2 + y^2 = 3^2 or x^2 + y^2 = 911. xyZ2 = 23.8 \times sin123(°)/38.9(iii) xy = x = 0(iii) xy = x = 0x^2 + x(4x) - 5 = 0y^2 - 12y + 27 = 0(x - 1)(x+5) = 0$ $(x - 1)(x+5) = 0$	9(a) Correct translation	B1	or A1 for calculating 72 required area
(b) Correct rotationB2B1 near miss of grid lines, or for clockwise 90° about (-1, -2) B1 for a netlection in $y = x$ , (0) Enlargement scale factor ½B2B1 for a netlection in $y = -x$ , OR for sight of the line $y = x$ B1 for any 1 line correct, or consistent incorrect fractional scale(d) Enlargement scale factor ½B2B1 for any 1 line correct, or consistent incorrect fractional scale(d) Enlargement scale factor ½B1(d) $26.7 = 11 \times d$ or $26.7 = 2 \times 111 \times r$ or $r = 26.7/11$ side 2 + side 2M1NiAccept rounded or truncated fractional scale(d) Enlargement scale factor ½A1Side 2 + side 2 + side 2A1Side 1 = constant 1 = (0, 096,cm)A1Perimeter = 24.(cm)B1F1 their diagonalB2B1 for either indicated in 2 quadrants, or both indicated in 1 quadrant scale(i) $y = x$ and $y = -x$ or equivalentB2(ii) $y = x$ and $y = -x$ or equivalent(iii) $y = x$ and $y = -x$ or equivalent(b) $x^2 + y^2 = 3^2$ or $x^2 + y^2 = 9$ SiCA0SiSiSi $xYZ = 238.8 \times in123(°)/38.9$ M1OR Subtraction from 1 * quation(x - 1)(x+5) = 0(y - 3)(y - 9) = 0x^2 + 4x - 5 = 0y^2 - 12y + 27 = 0(x - 1)(x+5) = 0(y - 3)(y - 9) = 0M1OR Subtraction from 1 * quation $x = 1, x = -5$ OR $y = 3, y = 9$ $x = 1, x = -5$ <tr< td=""><td></td><td></td><td></td></tr<>			
about (-2, -1), or for anticleckwise 90° about (a) 201 (-2, -1), or for anticleckwise 90° about (-1, -2)(c) Correct reflection in $y = x$ B2(d) Enlargement scale factor $V_2$ B1Correct positionB110. 26.7 = 11x d or 26.7 = 2 x I1x r or r = 26.7/IIM1Diagonal 2 = side <sup>2</sup> + side <sup>2</sup> M1aide <sup>2</sup> = diagonal <sup>2</sup> /2A1side length = 6(.0096cm)A1perimeter = 24.(cm)B1for any t ine correct, or and y = -x indicatedB2(ii) y = x and y = -x indicatedB2(iii) y = x and y = -x or equivalentB2(iii) y = x and y = -x or equivalentB2(b) $x^2 + y^2 = 3^2$ or $x^2 + y^2 = 9$ B112. sin XYZ/23.8 = sin123(°)/38.9M1sin YZZ = 30.871(°) rounded or truncated correctlyM1(x - 1)(x+5) = 0(y - 3)(y - 9) = 0(x - 1)(x+5) = 0(y - 3)(y - 9) = 0(x - 1)(x+5) = 0(y - 3)(y - 9) = 0(x - 1)(x+5) = 0(y - 3)(y - 9) = 0(x - 1)(x+5) = 0(y - 3)(y - 9) = 0(x - 1)(x+5) = 0(y - 3)(y - 9) = 0(x - 1)(x+5) = 0(y - 3)(y - 9) = 0(x - 1)(x+5) = 0(y - 3)(y - 9) = 0(x - 1)(x+5) = 0(y - 3)(y - 9) = 0(x - 1)(x+5) = 0(y - 3)(y - 9) = 0(x - 1)(x+5) = 0(y - 3)(y - 9) = 0(x - 1)(x+5) = 0(y - 3)(y - 9) = 0(x - 1)(x+5) = 0(y - 3)(y - 9) = 0(x - 1)(x+5) = 0(y - 3)(y - 9) = 0(x - 1)(x+5) = 0(y - 3)(y - 9) = 0(x - 1)(x+5) = 0(	(b) Correct rotation	B2	B1 near miss of grid lines, or for clockwise 90°
(c) Correct reflection in $y = x$ B2B1For a reflection in $y = -x$ , OR for sight of the line $y = x$ (d) Enlargement scale factor $V_2$ B2B1for a reflection in $y = -x$ , OR for sight of the line $y = x$ (d) Enlargement scale factor $V_2$ B1for any 11me correct, or consistent incorrect fractional scale(d) Enlargement scale factor $V_2$ B1(d) Enlargement scale factor $V_2$ B1(e) Correct positionB1(f) Tubular and $v = 25, T = 2 \times T   x + r or r = 26.7/T1M1Diagonal = 8.495 to 8.5(0) (cm)A1And tagonal = side2 + side2A1side length = 6(.0096cm)A1Perimeter = 24.(cm)B1T1.(a)(i) y = x and y = -x indicatedB2(ii) y = x and y = -x indicatedB2(iii) y = x and y = -x or equivalentB2(b) x^2 + y^2 = 3^2 or x^2 + y^2 = 9B1(ii) y = x and y = -x or equivalentB2(b) x^2 + y^2 = 3^2 or x^2 + y^2 = 9B1(ii) y = x and y = -x or equivalentB2(b) x^2 + y^2 = 3^2 or x^2 + y^2 = 9B1(iii) y = x and y = -x or equivalentB2(iii) y = x = 3, y = 1, x = 5M1(iv) x^2 + y^2 = 3^2 or x^2 + y^2 = 9M1(iii) y = x = 3, y = 9M1(iii) y = x = 0, y^2 - 12y + 27 = 0M1(iv) x^2 + 4x + 5 = 0(y - 3)(y - 9) = 0(x - 1)(x + 5) = 0(y - 3)(y - 9) = 0(x - 1)(x + 5) = 0(y - 3)(y - 9) = 0(x - 1)(x + 5) = 0(y - 3)($			about $(-2, -1)$ , or for anticlockwise 90° about $(-1, -2)$
(d) Enlargement scale factor $\frac{1}{2}$ B2OR for sight of the line $y = x$ B1 for any 1 line correct, or consistent incorrect fractional scale(d) Enlargement scale factor $\frac{1}{2}$ B1If any 1 line correct, or consistent incorrect fractional scale10. 26.7 = 11×d or 26.7 = 2 × II×r or r = 26.7/II biagonal = 8.495 to 8.5(0) (cm)M1 A1 Accept rounded or truncated11. diagonal = 3.462 + side = s	(c) Correct reflection in $y = x$	B2	B1 for a reflection in $y = -x$ ,
(d) Enlargement scale factor $\frac{1}{2}$ B2B1B1Correct positionB110. $26.7 = \Pi \times d$ or $26.7 = 2 \times \Pi \times r$ or $r = 26.7/\Pi$ M1Diagonal = 8.495 to $8.5(0)$ (cm)M1Diagonal = 8.495 to $8.5(0)$ (cm)A1Side = diagonal?A1side length = $6(.0096cm)$ A1Perimeter = 24.(cm)B1T1.(a)(i) y = x and y = -x indicatedB1(2 quadrants for both)B1B1B1 for either indicated in 2 quadrants, or both(ii) y = x and y = -x or equivalentB2(b) $x^2 + y^2 = 3^2$ or $x^2 + y^2 = 9$ 12. sin XYZ/23.8 = sin123(°)/38.9sin XYZ/23.8 = sin123(°)/38.9sin XYZ/23.8 = sin123(°)/38.9sin XYZ/23.8 = sin123(°)/38.9(i) y = 4 - x $x^2 + 4x - 5 = 0$ $(x - 1)(x+5) = 0$ $(x - 1)(x+$			OR for sight of the line $y = x$
Correct positionB1 8Iractional scale10. $26.7 = 11 \times d$ or $26.7 = 2 \times 11 \times r$ or $r = 26.7/11$ Diagonal $= 8.495$ to $8.5(0) (cm)$ M1 A1 M1 A1 B1Accept rounded or truncated FT their diagonalside $2 = diagonal^2/2$ side length $= 6(.0096cm)$ A1 A1 A1 Do not FT from inappropriate truncation or incorrect rounding (e.g. from $d = 8.4$ ) Answer here for A1 should round to 6.01 FT provided both M marks awarded for $4 \times '$ their side length'Perimeter $= 24.(cm)$ B1 for either indicated in 2 quadrants, or both indicated in 1 quadrant each B1 for either indicated are ach B1 for either equation(ii) $y = x$ and $y = -x$ or equivalentB2(ii) $y = x$ and $y = -x$ or equivalentB2(b) $x^2 + y^2 = 3^2$ or $x^2 + y^2 = 9$ B1 S1(i) $x^2 + y^2 = 3^2$ or $x^2 + y^2 = 9$ B1 S1(ii) $y = x$ and $y = -x$ or equivalentB2(b) $x^2 + y^2 = 3^2$ or $x^2 + y^2 = 9$ B1 S1(ii) $y = x$ and $y = -x$ or equivalentB2(b) $x^2 + y^2 = 3^2$ or $x^2 + y^2 = 9$ B1 S1(iii) $y = x$ and $y = -x$ or equivalentB2(iii) $y = x$ and $y = -x$ or equivalentB2(b) $x^2 + y^2 = 3^2$ or $x^2 + y^2 = 9$ M1 S1(iii) $y = x$ and $y = -x$ or equivalentB2(iii) $y = x$ and $y = -x$ or equivalentB2(iii) $y = x$ and $y = -x$ or equivalentB2(iii) $y = x$ and $y = -x$ or equivalentB2(iii) $y = x$ and $y = -x$ or equivalentB2(iii) $y = x$ and $y = -x$ or equivalentB2(iii) $x^2 + 4x = 3^2$	(d) Enlargement scale factor $\frac{1}{2}$	B2	B1 for any 1 line correct, or consistent incorrect
Outcet pointedBit10. $26.7 = 11 \times d \text{ or } 26.7 = 2 \times 11 \times r \text{ or } r = 26.7/11$ M1Diagonal = $8.495$ to $8.5(0)$ (cm)A1side = diagonal <sup>2</sup> /2M1side = diagonal <sup>2</sup> /2A1side length = $6(.0096cm)$ A1Perimeter = $24.(cm)$ B111.(a)(i) y = x and y = - x indicatedB2(i) y = x and y = - x indicatedB2(ii) y = x and y = - x or equivalentB2(ii) y = x and y = - x or equivalentB2(ii) y = x and y = - x or equivalentB2(ii) y = x and y = - x or equivalentB2(ii) y = x and y = - x or equivalentB2(ii) x = x and y = - x or equivalentB2(ii) y = x and y = - x or equivalentB2(ii) x = x and y = - x or equivalentB2(ii) x = x and y = - x or equivalentB2(iii) y = x and y = - x or equivalentB2(iii) y = x and y = - x or equivalentB2(iii) y = x and y = - x or equivalentB2(iii) y = x and y = - x or equivalentB2(iii) y = x and y = - x or equivalentB2(iii) y = x and y = - x or equivalentB2(iii) y = x and y = - x or equivalentB2(iii) y = x and y = - x or equivalentB2(iiii) y = x and y = - x or equivalentB2(iiii) y = x and y = - x or equivalentB1(iiii) y = x and y = - x or equivalentB2(iiii) y = x and y = - x or equivalentB2(iiii) y = x and y = - x or equivalentB2(iv) x = x and y = - x or equivalent </td <td>Correct position</td> <td>B1</td> <td>fractional scale</td>	Correct position	B1	fractional scale
10. $26.7 = 11 \times d \text{ or } 26.7 = 2 \times 11 \times r \text{ or } r = 26.7/\Pi$ MI A1 M1 M1 miagonal = $side^2 + side^2$ side length = $6(.0096\text{cm})$ MI A1 A1 M2 M2 Perimeter = 24.(cm)MI A1 A1 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1 M1 (2 quadrants for both)MI M1 M1 M1 M1 M1 M1 (2 quadrants for both)MI M1 M1 M1 M1 M1 M1 M1 (2 quadrants for both)MI M1 M1 M1 M2 M2 M1 M2 M2 M2 M1 M2 M2 M2 M2 M2 M2 M1 M2 M2 M2 M2 M2 M2 M2 M1 M2 M2 M2 M2 M2 M1 M2 M2 M2 M2 M2 M2 M2 M2 M2 M3 M1 M2 M2 M2 M2 M3 M1 M2 M2 M2 M3 M1 M2 M2 M2 M2 M2 M1 M2 M2 M2 M2 M2 M1 M2 M2 M2 M2 M2 M1 M2 M		8	
Diagonal = 8,495 to 8,5(0) (cm) diagonal = 8,495 to 8,5(0) (cm)A1 diagonal = 8,495 to 8,5(0) (cm)A1 MI FT their diagonalside = diagonal - 2 side = diagonal - 2A1 A1FT their diagonalside = lagonal - 2 side = diagonal - 2A1 A1side = lagonal - 2 side = 1, 2, 2, 3, y = 9A1 A1Perimeter = 24.(cm)B1 FT provided both M marks awarded for 4x 'their side length'11.(a)(i) y = x and y = - x indicated (2 quadrants for both)B2 B1 for either indicated in 2 quadrants, or both indicated in 1 quadrant each B1 for indication of appropriate points at least 3 in each of the 4 quadrant <i>Ignore any circles drawn</i> CAO. B1 for either equation(b) $x^2 + y^2 = 3^2$ or $x^2 + y^2 = 9$ sin XYZ = 23.8 × sin123(°)/38.9 sin XYZ = 23.8 × sin123(°)/38.9 $x^2 + x(4-x) - 5 = 0$ $x^2 - 4x - 5$ M1 OR For sight of $x^2 + xy = 4x$ OR $x = 4 - y$ A113. $y = 4 - x$ $x^2 + 4x - 5 = 0$ $y^2 - 12y + 27 = 0$ M1 A1 M1 OR For sight of $x^2 + xy = 4x$ OR $x^2 + 4x = 5$ 14. $x = 1, x = -5$ $y = 3, y = 9$ M1 $x = 1, x = -5$ OR subtraction from 1st equation OR $x^2 + 4x = 5$ 14. $x = 1, x = -5$ $y = 3, y = 9$ M1 $x = 1, x = -5$ OR subtraction from nethod OR alternative method to solve , e.g. formula with correct substitution and b^2-4ac correctly simplified13. $y = 4 - x$ $y = 3, y = 9$ $x = 1, x = -5$ M1 $x = 1, x = -5$ OR subtraction from 1st equation $OR x^2 + 4x = 5$ 14. $x = 1, x = -5$ $y = 3, y = 9$ $x = 1, x = -5$ M1 $A1$ OR there SCI for $x = 1, y = 3$ OR $x = -5, y = 9$ <i>provided alge</i>	10. 26.7 = $\Pi \times d$ or 26.7 = $2 \times \Pi \times r$ or $r = 26.7/\Pi$	M1	
InterformIf the induginalidid2 = diagonal/2idid2 = diagonal/2side1 = diagonal/2A1side1 = diagonal/2A1side1 = diagonal/2A1perimeter = 24.(cm)B111.(a)(i) y = x and y = - x indicatedB1(i) y = x and y = - x indicatedB1(ii) y = x and y = - x or equivalentB2(iii) y = x and y = - x or equivalentB2(iii) y = x and y = - x or equivalentB2(iii) y = x and y = - x or equivalentB2(iii) y = x and y = - x or equivalentB2(iii) y = x and y = - x or equivalentB2(iii) y = x and y = - x or equivalentB2(iii) y = x and y = - x or equivalentB2(iii) y = x and y = - x or equivalentB2(iii) y = x and y = - x or equivalentB2(iv) x <sup>2</sup> + y <sup>2</sup> = 3 <sup>2</sup> or x <sup>2</sup> + y <sup>2</sup> = 9B1(cAO)CAO12. sin XYZ/23.8 = sin123(°)/38.9M1sin XYZ = 30.871(°) rounded or truncated correctlyM1XYZ = 30.871(°) rounded or truncated correctlyM13OR For sight of x <sup>2</sup> + xy = 4x13. $y = 4 - x$ OR $x = 4 - y$ $x2 + x(4-x) - 5 = 0$ $y(-3)(y-9) = 0$ $x = 1, x = -5$ OR $y = 3, y = 9$ $x = 1, x = -5$ OR $y = 3, y = 9$ $x = 1, x = -5$ A1 $y = 3, y = 9$ $x = 1, x = -5$ A1A1A1A1A2A1A3A1A4A1A4A1A4A1	Diagonal = $8.495$ to $8.5(0)$ (cm)	Al M1	Accept rounded or truncated
Side - utagonal 2 side length = 6(.0096cm)A1Do not FT from inappropriate truncation or incorrect rounding (e.g. from $d = 8.4$ ) Answer here for A1 should round to 6.01Perimeter = 24.(cm)B1FT provided both M marks awarded for 4× 'their 	diagonal <sup>2</sup> = side <sup>2</sup> + side <sup>2</sup> side <sup>2</sup> = diagonal <sup>2</sup> /2		F1 their diagonal
IntermeterIntermeterIntermeterPerimeter = 24.(cm)B1 (2 quadrants for both)Incorrect rounding (e.g. from d = 8.4) Answer here for A1 should round to 6.01 FT provided both M marks awarded for 4x 'their 	side = diagonal /2 side length = $6(.0096 \text{ cm})$	A1 A1	Do not FT from inappropriate truncation or
Perimeter = 24.(,cm)Answer here for A1 should round to 6.01 FT provided both M marks awarded for 4x 'their side length'11.(a)(i) y = x and y = - x indicated (2 quadrants for both)B2B1 for either indicated in 2 quadrants, or both indicated in 1 quadrant each B1 for indicated in 1 quadrant each B1 for either indicated in 2 quadrants, or both 			incorrect rounding (e.g. from $d = 8.4$ )
Perimeter = 24.(cm)B1 6FT provided both M marks awarded for 4x 'their side length'11.(a)(i) y = x and y = - x indicated (2 quadrants for both)B2B1 for either indicated in 2 quadrants, or both indicated in 1 quadrant each B1 for indicated in 1 quadrant each B1 for either equation(ii) y = x and y = - x or equivalentB2B1 CAO. B1 for either equation(b) $x^2 + y^2 = 3^2$ or $x^2 + y^2 = 9$ B1 SCAO12. sin XYZ/23.8 = sin123(°)/38.9 sin XYZ = 23.8 × sin123(°)/38.9 xYZ = 30.871.(°) rounded or truncated correctlyM1 A1 A1OR 23.8/sin XYZ = 38.9/sin123(°) OR sin^1 0.513 This M1 implies previous M113. $y = 4 - x$ $2x^2 + x(4 - x) - 5 = 0$ $x^2 + 4x - 5 = 0$ $x^2 - 12y + 27 = 0$ M1 A1 A1 A1OR For sight of $x^2 + xy = 4x$ OR subtraction from 1st equation OR $x^2 + 4x = 5$ (x - 1)(x+5) = 0 $y = 3, y = 9$ $y = 3, y = 9$ M1 $x = 1, x = -5$ $y = 3, y = 9$ M1 $x = 1, x = -5$ FT provided quadratic from an appropriate substitution method or solve, e.g. formula with correct substitution and b <sup>2</sup> -4ac correctly simplified $x = 1, x = -5$ $y = 3, y = 9$ A1 $x = 1, x = -5$ A1 $A1$ $A1$ $f A0, A0$ then SC1 for $x = 1, y = 3$ OR $x = -5, y = 9$ provided algebraic method shown with appropriate M1, M1, M1 marks $6$ No marks for trial & improvement methods			Answer here for A1 should round to 6.01
11.(a)(i) $y = x$ and $y = -x$ indicatedB1If or either indicated in 2 quadrants, or both indicated in 1 quadrant each B1 for either indicated in 1 quadrant each B1 for indication of appropriate points at least 3 in each of the 4 quadrants Ignore any circles drawn CAO. B1 for either equation(ii) $y = x$ and $y = -x$ or equivalentB2B1CAO(b) $x^2 + y^2 = 3^2$ or $x^2 + y^2 = 9$ B1 Sin XYZ = 3.8 × sin123(°)/38.9 sin XYZ = 30.871(°) rounded or truncated correctlyM1 A1 3OR 23.8/sin XYZ = 38.9/sin123(°) OR sin <sup>-1</sup> 0.513 This M1 implies previous M113. $y = 4 - x$ $2x^2 + x(4-x) - 5 = 0$ $x^2 + 4x - 5 = 0$ OR $x = 4 - y$ $2(4-y)^2 + (4-y)y - 5 = 0$ $y^2 - 12y + 27 = 0$ M1 M1 M1 M1 OR For sight of $x^2 + xy = 4x$ OR subtraction from 1 <sup>st</sup> equation OR $x^2 + 4x = 5$ (x - 1)(x+5) = 0 $y = 3, y = 9$ (y - 3)(y - 9) = 0M1 A1FT provided quadratic from an appropriate substitution method to solve , e.g. formula with correct substitution and b <sup>2</sup> -4ac correctly simplified $x = 1, x = -5$ $y = 3, y = 9$ OR $x = 1, x = -5$ A1 A1 $f A0, A0$ then SC1 for $x = 1, y = 3$ OR $x = -5, y = 9$ provided algebraic method shown with appropriate M1, M1, M1 marks6No marks for trial & improvement methods	Perimeter = 24.(cm)	BI 6	FT provided both M marks awarded for $4 \times$ 'their side length'
(2 quadrants for both)indicated in 1 quadrant each B1 for indication of appropriate points at least 3 in each of the 4 quadrants Ignore any circles drawn 	11.(a)(i) $y = x$ and $y = -x$ indicated	B2	B1 for either indicated in 2 quadrants, or both
B1 for indication of appropriate points at least 3 in each of the 4 quadrants Ignore any circles drawn CAO. B1 for either equation(ii) $y = x$ and $y = -x$ or equivalentB2(b) $x^2 + y^2 = 3^2$ or $x^2 + y^2 = 9$ B1 S12. sin XYZ/23.8 = sin123(°)/38.9 sin XYZ = 30.871 (°) rounded or truncated correctlyM1 A1 313. $y = 4 - x$ $2x^2 + x(4-x) - 5 = 0$ $x^2 + 4x - 5 = 0$ OR $2(4-y)^2 + (4-y)y - 5 = 0$ $y^2 - 12y + 27 = 0$ M1 M1 M1 M1 OR OR OR M1 OR Subtraction from 1 <sup>st</sup> equation OR $x^2 + 4x = 5$ (x - 1)(x+5) = 0(y - 3)(y - 9) = 0M1 X = 1, $x = -5$ FT provided quadratic from an appropriate substitution method or subtraction method OR alternative method to solve , e.g. formula with correct substitution and b <sup>2</sup> -4ac correctly simplified $x = 1, x = -5$ $y = 9$ A1 $x = 1, x = -5$ If A0, A0 then SCI for $x = 1, y = 3$ OR $x = -5, y = 9$ provided algebraic method shown with appropriate M1, M1, M1 marks	(2 quadrants for both)		indicated in 1 quadrant each
(ii) $y = x$ and $y = -x$ or equivalentB2each of the 4 quadrants Ignore any circles drawn CAO. B1 for either equation(b) $x^2 + y^2 = 3^2$ or $x^2 + y^2 = 9$ B1 SCAO12. sin XYZ/23.8 = sin123(°)/38.9 sin XYZ = 30.871 (°) rounded or truncated correctlyM1 A1 3OR 23.8/sin XYZ = 38.9/sin123(°) OR sin^{-1} 0.513 This M1 implies previous M113. $y = 4 - x$ $2x^2 + x(4-x) - 5 = 0$ $x^2 + 4x - 5 = 0$ OR $x = 4 - y$ $2(4-y)^2 + (4-y)y - 5 = 0$ $y^2 - 12y + 27 = 0$ M1 M1 M1 A1OR For sight of $x^2 + xy = 4x$ OR Subtraction from $1^{st}$ equation OR $x^2 + 4x = 5$ (x - 1)(x+5) = 0 $y = 3, y = 9$ (y -3)(y - 9) = 0M1 A1FT provided quadratic from an appropriate substitution method or subtraction method OR alternative method to solve , e.g. formula with correct substitution and b <sup>2</sup> -4ac correctly simplified $x = 1, x = -5$ $y = 9$ A1 $x = 1, x = -5$ If A0, A0 then SCI for $x = 1, y = 3$ OR $x = -5, y = 9$ provided algebraic method shown with appropriate M1, M1, M1 marks6No marks for trial & improvement methods			B1 for indication of appropriate points at least 3 in
(ii) $y = x$ and $y = -x$ or equivalentB2CAO. B1 for either equation(b) $x^2 + y^2 = 3^2$ or $x^2 + y^2 = 9$ B1 Sin XYZ = 23.8 × sin123(°)/38.9 sin XYZ = 23.8 × sin123(°)/38.9 XYZ = 30.871(°) rounded or truncated correctlyM1 A1 3OR 23.8/sin XYZ = 38.9/sin123(°) OR sin^{-1} 0.513 This M1 implies previous M113. $y = 4 - x$ $2x^2 + x(4-x) - 5 = 0$ $x^2 + 4x - 5 = 0$ OR $x = 4 - y$ $2(4-y)^2 + (4-y)y - 5 = 0$ $y^2 - 12y + 27 = 0$ M1 M1 A1 OROR For sight of $x^2 + xy = 4x$ OR subtraction from 1st equation OR $x^2 + 4x = 5$ (x - 1)(x+5) = 0 $y = 3, y = 9$ (y - 3)(y - 9) = 0M1 A1FT provided quadratic from an appropriate substitution method or subtraction method OR alternative method to solve , e.g. formula with correct substitution and b <sup>2</sup> -4ac correctly simplified $x = 1, x = -5$ $y = 3, y = 9$ A1 $x = 1, x = -5$ A1 A1 $f A0, A0$ then SC1 for $x = 1, y = 3$ OR $x = -5, y = 9$ provided algebraic method shown with appropriate M1, M1 marks6No marks for trial & improvement methods			each of the 4 quadrants
(b) $x^2 + y^2 = 3^2$ or $x^2 + y^2 = 9$ B1 5CAO12. sin XYZ/23.8 = sin123(°)/38.9 sin XYZ = 23.8 × sin123(°)/38.9 XYZ = 30.871(°) rounded or truncated correctlyM1 A1 3OR 23.8/sin XYZ = 38.9/sin123(°) OR sin <sup>-1</sup> 0.513 This M1 implies previous M113. $y = 4 - x$ $2x^2 + x(4-x) - 5 = 0$ $x^2 + 4x - 5 = 0$ OR $x = 4 - y$ $2(4-y)^2 + (4-y)y - 5 = 0$ $y^2 - 12y + 27 = 0$ M1 M1 M1 A1 OROR For sight of $x^2 + xy = 4x$ OR Subtraction from 1st equation OR $x^2 + 4x = 5$ (x - 1)(x+5) = 0 $y = 3, y = 9$ (y - 3)(y - 9) = 0M1 A1FT provided quadratic from an appropriate substitution method to solve , e.g. formula with correct substitution and b²-4ac correctly simplified $x = 1, x = -5$ $y = 3, y = 9$ OR $x = 1, x = -5$ A1 A1 A1 $f A0, A0$ then SC1 for $x = 1, y = 3$ OR $x = -5, y = 9$ provided algebraic method shown with appropriate M1, M1, M1 marks6No marks for trial & improvement methods	(ii) $y = x$ and $y = -x$ or equivalent	B2	CAO. B1 for either equation
(b) $x^2 + y^2 = 3^2$ or $x^2 + y^2 = 9$ B1 5CAO12. sin XYZ/23.8 = sin123(°)/38.9 sin XYZ = 23.8 × sin123(°)/38.9 XYZ = 30.871(°) rounded or truncated correctlyM1 A1 3OR 23.8/sin XYZ = 38.9/sin123(°) OR sin^-1 0.513 This M1 implies previous M113. $y = 4 - x$ $2x^2 + x(4-x) - 5 = 0$ $x^2 + 4x - 5 = 0$ OR $x = 4 - y$ $2(4-y)^2 + (4-y)y - 5 = 0$ $y^2 - 12y + 27 = 0$ M1 M1 M1 A1 OROR For sight of $x^2 + xy = 4x$ OR Subtraction from 1st equation OR $x^2 + 4x = 5$ (x - 1)(x+5) = 0(y - 3)(y - 9) = 0M1 X = 1, $x = -5$ FT provided quadratic from an appropriate substitution method or subtraction method OR alternative method to solve, e.g. formula with correct substitution and b²-4ac correctly simplified $x = 1, x = -5$ $y = 3, y = 9$ OR $x = 1, x = -5$ A1 A1 A1 $A1$ $A1$ $A1$ A1 A1 $A1$ $A2$ $A3$ $A2$ $A3$ $A4$ $A1$ $A1$ $A3$ $A1$ $A2$ $A3$ $A3$ $A1$ $A1$ $A3$ $A4$ $A1$ $A1$ $A3$ $A1$ $A3$ $A1$ $A3$ $A4$ <td></td> <td></td> <td>1</td>			1
12. $\sin XYZ/23.8 = \sin 123(^{\circ})/38.9$ M1 $\sin XYZ = 23.8 \times \sin 123(^{\circ})/38.9$ M1 M1 A1 	(b) $x^2 + y^2 = 3^2$ or $x^2 + y^2 = 9$	B1 5	CAO
sin XYZ = $23.8 \times sin123(^{\circ})/38.9$ M1 A1 3OR sin^-1 0.513 This M1 implies previous M1XYZ = $30.871(^{\circ})$ rounded or truncated correctlyA1 3OR13. $y = 4 - x$ 	12. $\sin XYZ/23.8 = \sin 123(^{\circ})/38.9$	M1	OR 23.8/sin XYZ = 38.9/sin123(°)
XYZ = $30.8/1(^{\circ})$ rounded or truncated correctlyA1 313. $y = 4 - x$ $2x^2 + x(4-x) - 5 = 0$ $x^2 + 4x - 5 = 0$ OR $2(4-y)^2 + (4-y)y - 5 = 0$ $y^2 - 12y + 27 = 0$ M1 A1OR OR Subtraction from 1st equation OR $x^2 + 4x = 5$ (x - 1)(x+5) = 0(y - 3)(y - 9) = 0M1 A1FT provided quadratic from an appropriate substitution method or subtraction method OR alternative method to solve , e.g. formula with correct substitution and b²-4ac correctly simplifiedx = 1, x = -5 y = 3, y = 9OR x = 1, x = -5A1 A1If A0, A0 then SC1 for x = 1, y = 3 OR x = -5, y = 9 provided algebraic method shown with appropriate M1, M1, M1 marks6No marks for trial & improvement methods	$\sin XYZ = 23.8 \times \sin 123(^{\circ})/38.9$	M1	OR sin <sup>-1</sup> 0.513 This M1 implies previous M1
13. $y = 4 - x$ $2x^2 + x(4-x) - 5 = 0$ $x^2 + 4x - 5 = 0$ OR $2(4-y)^2 + (4-y)y - 5 = 0$ $y^2 - 12y + 27 = 0$ M1 M1 A1OR OR Subtraction from 1st equation OR $x^2 + 4x = 5$ $(x - 1)(x+5) = 0$ $(x - 1)(x+5) = 0$ $(y - 3)(y - 9) = 0$ M1FT provided quadratic from an appropriate substitution method or subtraction method OR alternative method to solve , e.g. formula with correct substitution and b²-4ac correctly simplified $x = 1, x = -5$ $y = 3, y = 9$ OR $x = 1, x = -5$ $y = 3, y = 9$ A1 $y = 3, y = 9$ A1 $x = 1, x = -5$ A1 A1If A0, A0 then SC1 for $x = 1, y = 3$ OR $x = -5, y = 9$ provided algebraic method shown with appropriate M1, M1, M1 marks6No marks for trial & improvement methods	XYZ = 30.871(°) rounded or truncated correctly	3	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	13. $y = 4 - x$ OR $x = 4 - y$	M1	OR For sight of $x^2 + xy = 4x$
$x^{-} + 4x - 5 = 0$ $y^{-} - 12y + 27 = 0$ AlOR $x^{2} + 4x = 5$ $(x - 1)(x + 5) = 0$ $(y - 3)(y - 9) = 0$ M1FT provided quadratic from an appropriate substitution method or subtraction method OR alternative method to solve, e.g. formula with correct substitution and b <sup>2</sup> -4ac correctly simplified $x = 1, x = -5$ OR $y = 3, y = 9$ A1 $y = 3, y = 9$ $x = 1, x = -5$ A1 $y = 3, y = 9$ $x = 1, x = -5$ A1 $A1$ $A2$ $A2$ $A3$ $A1$ $A3$ $A3$ $A4$ $A3$ $A4$	$2x^{2} + x(4-x) - 5 = 0 \qquad 2(4-y)^{2} + (4-y)y - 5 = 0$	M1	OR Subtraction from $1^{st}$ equation
(x - 1)(x+5) = 0 $(y -3)(y -9) = 0$ M1FT provided quadratic from an appropriate substitution method or subtraction method OR alternative method to solve , e.g. formula with correct substitution and b <sup>2</sup> -4ac correctly simplified $x = 1, x = -5$ OR $y = 3, y = 9$ A1 $y = 3, y = 9$ $x = 1, x = -5$ A1A2A1A3A1A4A1A4A1A4A1A5A2A4<	$x^{2} + 4x - 5 = 0 \qquad y^{2} - 12y + 27 = 0$	A1	$OR  x^2 + 4x = 5$
x = 1, x = -5 $y = 3, y = 9$ $x = 1, x = -5$ $A1$ $x = 1, x = -5$ $A1$ $A1$ $y = 3, y = 9$ $x = 1, x = -5$ $A1$ $A2$ $A1$ $A1$ $A1$ $A2$ $A2$ $A2$ $A2$ $A3$ $A1$ $A1$ $A1$ $A2$ $A2$ $A3$ $A2$ $A3$ $A1$ $A3$ $A1$ $A3$ $A1$ $A3$ $A2$ $A3$ $A1$ $A4$ $A1$ $A3$ $A1$ $A4$ $A1$ $A3$ $A1$ $A4$ $A1$ $A4$ $A1$ $A4$ $A1$ $A4$ $A1$	(x - 1)(x+5) = 0 $(y - 3)(y - 9) = 0$	M1	FT provided quadratic from an appropriate
$x = 1, x = -5$ $y = 3, y = 9$ OR $x = 1, x = -5$ $y = 3, y = 9$ OR $x = 1, x = -5$ OR A1 A1OR alternative method to solve , e.g. formula with correct substitution and $b^2$ -4ac correctly simplified $A1$ $A1$ A1A1 $If A0, A0$ then SC1 for $x = 1, y = 3$ OR $x = -5, y = 9$ provided algebraic method shown with appropriate M1, M1, M1 marks $6$ No marks for trial & improvement methods			substitution method or subtraction method
x = 1, x = -5 $y = 3, y = 9$ OR $x = 1, x = -5$ $y = 3, y = 9$ Correct substitution and b²-4ac correctly simplified $A1$ $A1$ $A1$ $A1$ $A1$ $A1$ $A1$ $A1$ $If A0, A0$ then SC1 for $x = 1, y = 3$ OR $x = -5, y = 9$ provided algebraic method shown with appropriate M1, M1, M1 marks $6$ No marks for trial & improvement methods			OR alternative method to solve , e.g. formula with
$ \begin{array}{c} x = 1, x = -3 \\ y = 3, y = 9 \end{array} \begin{array}{c} OK \\ x = 1, x = -5 \end{array} \end{array} \begin{array}{c} A1 \\ A1 \\ If A0, A0 \ then \ SC1 \ for \ x = 1, \ y = 3 \ OR \ x = -5, \ y = 9 \\ provided \ algebraic \ method \ shown \ with \\ appropriate \ M1, \ M1 \ marks \end{array} $	x = 1, x = 5 OD $x = 2, 0$	A 1	correct substitution and b <sup>2</sup> -4ac correctly simplified
<i>If A0, A0 then SC1 for x= 1, y=3 OR x= -5, y=9</i> <i>provided algebraic method shown with</i> <i>appropriate M1, M1, M1 marks</i> <i>6 No marks for trial &amp; improvement methods</i>	$ \begin{array}{c} x = 1, x = -3 \\ y = 3, y = 9 \end{array} $ OK $y = 3, y = 9 \\ x - 1, x5 \end{array} $	AI A1	
provided algebraic method shown with appropriate M1, M1, M1 marks 6 No marks for trial & improvement methods	$ \begin{array}{c} y = 0, \ y = 0 \end{array} $	111	If A0, A0 then SC1 for $x = 1$ , $y = 3$ <b>OR</b> $x = -5$ , $y = 9$
appropriate M1, M1 marks 6 No marks for trial & improvement methods			provided algebraic method shown with
6 No marks for trial & improvement methods			appropriate M1, M1, M1 marks
		6	No marks for trial & improvement methods

Methods in Mathematics Unit 2 Higher Tier June 2014	Mark	Comment
14(a) 6:2 and 7:QR or equivalent, or scale factor 7/6	B1	OR 6:8 and 7: <b>PR</b> or equivalent
$QR = 2 \times 7 \div 6$ or equivalent	M1	OR $\mathbf{PR} = 7 \times 8 \div 6 (= 9.33)$ or equivalent
QR = 2.3(33cm)	A1	
(b) $AE = 4x$ AE = 5.5 v	B1 B1	
(Perimeter -) 6x + 8.5y or 6x + 17y/2 ISW	B1	CAO Must be simplified
(1  children -) 0x + 0.5y  of  0x + 1/y/2  is w	DI	Accept $\frac{1}{2}(12x + 17y)$
	6	Answers of $4x + 5.5y + 2x + 3y$ imply B1, B1, B0
15. $b = 45(^{\circ})$	B1	
$c = 180(^{\circ})$	B1	
	2	
16(a) HK = HL + LK (= $5x + 6y + 3x - 6y$ )	M1	
$= 8\mathbf{x} (+0\mathbf{y})$	A1	
(b)(i) $LN = 3x - 6y + 18x - 36y (=21x - 42y)$	M1	
k = 7	A1	May be embedded. Award M1, A1 for sight of k=7
(ii) Collinear (or lie along the same straight line)	B1	Do not accept parallel as a full description
	5	
17. Area of the square base = $119.8 - 4 \times 23.6$	M1	
$= 25.4 (cm^2)$	A1	
(Volume pyramid) $76.4 = \frac{1}{3} \times 25.4 \times \text{height}$	m1	FT their area of square base Note $\sqrt{25.4} = 5.0398 \times 5.0398$
height = 9.02 cm	A1*	
(Volume cone) $44.4 = \frac{1}{3} \times \pi \times r^2 \times \text{height}$	M1*	Depends on all previous method marks, FT their height
$r^2 = 44.4/(\frac{1}{3} \times \pi \times height)$	M1	FT equivalent difficulty, isolating $r^2$
	A1	CAO.
$r^2 = (44.4 \times \frac{1}{3} \times 25.4) / (76.4 \times \frac{1}{3} \times \pi)$		OR $r^2 = 4.7$ , or an appropriate unrounded r, r =
$r^2 = 4.69$ to $4.701$		2.1681875 to 2.17
(radius) 2.17 or 2.2 (cm)	A1	CAO.
		Appropriate degree of accuracy required
		Alternative for A1*, M1*
		Equating heights, $76.4 \pm 0.04 \times 25.4$ = 44.4 $\pm 0.04 \times 10^{-2}$
		$(0.4 / (7_3 \times 25.4) = 44.4 / (7_3 \times \pi \times r))$
		For information:
		$Common \ height = 9.02(cm)$
	8	<i>Height of a triangular face</i> = $9.37(cm)$

GCSE Methods in Mathematics MS Summer 2014



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