GCSE MARKING SCHEME

MATHEMATICS - UNITISED

SUMMER 2013

INTRODUCTION

The marking schemes which follow were those used by WJEC for the Summer 2013 examination in GCSE MATHEMATICS - UNITISED. 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.

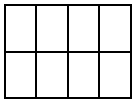
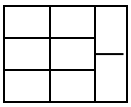
WJEC regrets that it cannot enter into any discussion or correspondence about these marking schemes.

GCSE MATHEMATICS - UNITISED - MARK SCHEME

SUMMER 2013

UNIT 1 - FOUNDATION TIER

JUNE 2013 UNIT 1 Foundation	✓	Mark	FINAL MARK SCHEME Comments
1. (Scarf £30.00) (2 bottles of shampoo at £3.99 each) (£) 7.98 (+) (Total bill) £37.98	✓ ✓	B1 B1	F.T. £30 + 'their £7.98'. (£)37.98 implies B1B1.
(Total value of vouchers) (£)35(.00)	✓	B1	
(Extra cash required £37.98 – £35.00 =) (£)2.98	✓	B1	F.T. 'their £37.98' – 'their £35'. *Alternative methods* *(£)35 – (£)30 =(£)5 OR (£)35 – (£)7.98 = (£)27.02* *(£)7.98 – (£)5 =(£)2.98 (£)30 – (£)27.02 = (£)2.98* *B1 for (£)35, B1 for (£)7.98, B1 for (£)5 or (£)27.02 and B1 for (£)2.98.*
Look for • spelling • clarity of text explanations and correct units shown • the use of notation (watch for the use of '=', '+' and '–' being appropriate) 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	✓ ✓	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. QWC1. Presents relevant material in a coherent and logical manner, but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident weakness in organisation of material but using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar. QWC0. Evident weakness in organisation of material and errors in use of mathematical form, spelling, punctuation and grammar. <u>An unsupported answer is QWC0.</u>
2. (a) 12 m^3		B1 U1	Independent of the B1
2. (b) 10 m^2		B1 U1	Independent of the B1
3.(a) 80		B1	
3.(b) 95		B1	
3.(c) 'Two and a half' symbols drawn.		B1	Ignore size and poor diagrams if intention is clear.
3.(d) Explanations such as e.g. 'the symbol is only suited for multiples of 5', '62 is not in the five times table', '2 would be difficult to show'.		B1	Accept equivalent statements BUT there must be a consideration of the 62 in some way e.g. Allow 'It (only) goes up in 5s' for B1, but B0 for 'each triangle is worth 5'.
4. A line of length 6cm drawn. An angle of 55° drawn at correct position.		 B1 B1	***Use overlay.*** Allow ± 0·2cm. Allow ± 2°.

JUNE 2013 UNIT 1 Foundation	✓	Mark	FINAL MARK SCHEME Comments
5. (Cost of trees =) 24 × (£)5 = (£)120 (Time taken =) 24 × ¼ = 6(hours) (Total bill =) 6 × (£)10 + (£)120 = (£)180	✓ ✓ ✓ ✓ ✓ ✓	M1 A1 M1 A1 M1 A1	24 × 15 = 360 is M0A0 but allow F.T. of 360 for final M1A1. F.T. 'their time taken' BUT not 15 or 0·25 or 0·15 or 24. F.T 'their cost of trees' BUT not (£)5 or (£)24.
6. (May UK Single) May UK Touring May I Single May I Touring Sept UK Single Sept UK Touring Sept I Single Sept I Touring		B3	Accept any unambiguous indication for month, destination and type. Do not credit or penalise repeated combinations For all 7 correct. B2 for 5 or 6 correct. B1 for 3 or 4 correct.
7.  	✓ ✓ ✓ ✓ ✓	B2 B3	*If both of the two <u>different</u> ways shown are of the sort which could gain a B3 then allow B3in the first instance and B2 for the second one.* B1 for strategy of 2+2+2+2 = 8 OR 3+3 = 6. BUT B0 if more than 8 tiles shown. B0 if any inconsistent matching of tile sides (e.g. implying 2m = 3m). Or equivalent. B1 for strategy 2+2+2 = 6. B1 for strategy 3+3+2 = 8. BUT B0 if more than 8 tiles shown. B0 if any inconsistent matching of tile sides (e.g. implying 2m = 3m).
8.(a) 9·58		B1	
8.(b) A statement that recognises that 6·3m = 6m 30cm or 6m + 4cm = 6.04 metres e.g. 'No she must increase her jump by more than 30cm' or 'her jump would be only 6.04 metres'.		B1	Accept 'She must jump 31cm further'. Also allow 'She must jump 40cm further' as an indication that the candidate realises that 100cm = 1 m.
9. (£)44 – (£)12 = (£)32 32 ÷ 8 = 4 (Hired mixer for) 5(days)	✓ ✓ ✓ ✓ ✓	M1 A1 M1 A1 A1	F.T. 'their 32'. F.T. 'their 4' + 1. SC1 for 44/8 = 5½ (or 6) days SC2 for 44/8 = 5½ (or 6) days , therefore 6½ (or 7)days
10. (a) 750 × 1·2(0) = 900 (euros)		M1 A1	
10(b) 96 ÷ 1·2(0) = (£)80 (A difference of) (£)5		M1 A1 A1	OR (85 × 1·2) – 96 M1 (6euros gain M1) ÷ 1·2 m1 (£) 5 A1
10 (c)(i) 3000 (metres)		B1	
10(c) (ii) 3 × 5/8 (= 15/8) 2 (miles)		M1 A1	An answer of 2(miles) clearly found from an incorrect method e.g. 3 × ½ = 1½ ≈ 2(miles) is M0A0. For this question allow 1·5km ≈ 1mile so 3km ≈ 2miles.

JUNE 2013 UNIT 1 Foundation	✓	Mark	FINAL MARK SCHEME Comments
Ribbon marking for 11(a) and 11(b). 11. (a) Uniform scale on vertical axis.		B1	*P0,L0 if no attempt at uniform scaling.*
Plotting at least two correct points.		P1	± '½ a small square'. The origin may be one of the points.
Correct line drawn.		L1	Correct line implies P1L1.
(b) (10 stone =) 140 (lbs)		B1	For sight of 140. It may be implied in further work.
Any correct strategy, e.g. 14 times their value at 10 lbs.		M1	Accept 10 times their value at 14lbs, if line drawn extends that far.
A correct answer <u>for their line</u>.		A1	F.T. their line, OR B1, M1, A1 for answers between 63(kg) and 64(kg) inclusive.
12. (Cost of units) 1380 × 12·3	✓	M1	
(£)169.74 or 16974(p)	✓	A1	Allow £169.74p but A0 for £16974 or 169.74p.
(Cost of units and std.chg.) (£)183.6(0) or 18360(p)	✓	B1	F.T. 'their cost of units' + £13.86. However, B0 if 'mixed units' used after award of A1.
(£)183.60 × 1·05 OR (£)183.60 + (£)183.60 × 0·05	✓	M1	F.T. their total cost. Accept working in pence.
= £192.78 or 19278p	✓	A1	Units must be given or clearly implied from previous work.
13.			B0,B0,B0 if fewer than five numbers shown.
Showing only two numbers changed.	✓	B1	
Numbers give a range of 11.	✓	B1	B0 if using the same five numbers.
Numbers give a mean of 11.	✓	B1	
14. $\frac{28000 - 22960}{28000}$ (× 100)		M1	
= 18(%)		A1	
15. (Distance =) 2½ × 30	✓	M1	Allow M1 for 2·3(0) × 30.
= 75 (miles)	✓	A1	C.A.O.
(Average speed =) 75 ÷ 3	✓	M1	F.T. 'their 75'.
= 25 (mph)	✓	A1	

JUNE 2013 UNIT 1 Higher	✓	Mark	FINAL MARK SCHEME Comments
1. (Cost of units) $1380 \times 12{\cdot}3$	✓	M1	
(£)169.74 or 16974(p)	✓	A1	Allow £169.74p but B0 for £16974 or 169.74p.
(Cost of units and std.chg.) (£)183.6(0) or 18360(p)	✓	B1	F.T. 'their cost of units' + £13.86. However, B0 if 'mixed units' used after award of A1.
(£)183.60 × 1·05 OR (£)183.60 + (£)183.60 × 0·05	✓	M1	F.T. their total cost. Accept working in pence.
= £192.78 or 19278p	✓	A1	Units must be given or clearly implied from previous work.
Ribbon marking for 2(a) and 2(b).			
2. (a) Uniform scale on vertical axis.		B1	*P0,L0 if no attempt at uniform scaling.*
Plotting at least two correct points.		P1	± '½ a small square'. The origin may be one of the points.
Correct line drawn.		L1	Correct line implies P1L1.
(b) (10 stone =) 140 (lbs)		B1	For sight of 140. It may be implied in further work.
Any correct strategy, e.g. 14 times their value at 10 lbs.		M1	Accept 10 times their value at 14lbs, if line drawn extends that far.
A correct answer <u>for their line</u>.		A1	F.T. their line, OR B1, M1, A1 for answers between 63(kg) and 64(kg) inclusive.
3.			B0,B0,B0 if fewer than five numbers shown.
Showing only two numbers changed.	✓	B1	
Numbers give a range of 11.	✓	B1	B0 if using the same five numbers.
Numbers give a mean of 11.	✓	B1	
4. Sight of 360 / 18 or $20^{(\circ)}$ OR sight of $100^{(\circ)}$		B1	Clear incorrect methods such as 18/4 = 4·5 so 5 wins is B0,M0,A0.
(Spanish winners =) 100 / 20 OR 18 × 100/360		M1	
= 5 (wins)		A1	*Allow SC2 for an answer of 4(wins) when 80° is seen to be used instead of 100°.*
5. Sight of $\frac{(100 + 40)}{2} \times BC$ or equivalent	✓	B1	For a correct expression for the total area of ABCD in terms of BC. F.T. their area only if in terms of BC and is dimensionally correct.
$\frac{(100 + 40)}{2} \times BC = 3500$	✓	M1	For equating their expression for area, <u>in terms of BC</u>, with 3500.
$BC = 2 \times 3500 / 140$	✓	A1	Further F.T. only if of equivalent difficulty
= 50(m)	✓	A1	
6. (Distance =) 2½ × 30	✓	M1	Allow M1 for 2·3(0) × 30.
= 75 (miles)	✓	A1	C.A.O.
(Average speed =) 75 ÷ 3	✓	M1	F.T. 'their 75'.
= 25 (mph)	✓	A1	
7. (a) (i) There is no scale on the 'number of squirrels' axis.		B1	Accept equivalent valid statement.
(ii) 40 shown on vertical axis **and** a correct graph that shows 'consecutive doubling'.		B1	
7(b) States that 'interim' readings between consecutive noon times are not correct.		B1	Accept statements that imply this, e.g. 'temperatures at midnights are wrong', 'only accurate at 12pm.'

JUNE 2013 UNIT 1 Higher	✓	Marks	FINAL MARK SCHEME Comments
8. 12000 480 12480 499.2(0) 12979.2(0) 519.16(8) 13498.36(8) OR 480, 499.2(0) and 519.16(8) (Compound interest earned =) (£)1498.37	✓ ✓ ✓ ✓	B1 M1 A1 A1	For the evaluation of a correct 4% OR Sight of 1·04 (1440 implies 3× 480 and gains B1). For attempting to find 3 different 4%. OR B1 M1 for $12000 \times 1{\cdot}04^3$. F.T. one error. Accept (£)1498.36 A0 for (£)1498.368 *Treat calculation for 2 or 4 years as a misread.* *Penalise a depreciation calculation –1.*
9. (Greatest length of handrail =) 6005 (cm) (Least length of metal strip=) 39·5(cm) (Minimum number of strips required) $\frac{6005}{39{\cdot}5}$ = 152·02(....) (Minimum required) 153.	✓ ✓ ✓ ✓ ✓	B1 B1 M1 A1 B1	For sight of 6005 or 60·05(m). For sight of 39·5 or 0·395(m). Or equivalent. Must use same units of length. F.T. their values only if 'rail' > 6000 and 'strip' < 40. F.T. 'their 152·02..' only if a division 'Path / Strip' seen and an attempt to use the same units.
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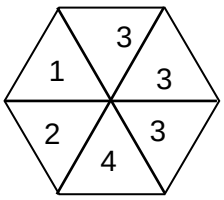
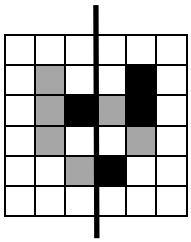
10(a) $20 \times \frac{600}{500}$ $\times \frac{1}{3}$ = 8 (min) or 480 seconds.		M1 M1 A1	Or equivalent. Or equivalent. C.A.O. *For partial work for old photocopier* *Award M1 for stating '600 sheets in 24 min'.* *For partial work for new photocopier* *Award M1 for stating '500 sheets in 20/3 or 6·66.. min'.*
10(b) 7⅓ ISW		B2	Accept $7\frac{15}{45}$ or $7\frac{3}{9}$. B1 for sight of 33/5 × 10/9 or 22/3 or equivalent. B0 for 7·3..... B0 for $7\frac{3}{10.}$

JUNE 2013 UNIT 1 Higher	✓	Marks	FINAL MARK SCHEME Comments
11. Use of $1{\cdot}2 \times 1{\cdot}26$	✓	M1	*These values may be used in conjunction with the*
$= 1{\cdot}512$	✓	A1	*candidate's choice of initial sum of pounds.* F.T. only if M1 gained.
Sight of ('loss of') $0{\cdot}068$	✓	B1	*Alternative method for final three marks.*
Use of $\frac{1{\cdot}58 - 1{\cdot}512}{1{\cdot}58}$ $(\times 100)$	✓	M1	*$1 - \frac{1{\cdot}512}{1{\cdot}58}$ $(\times 100)$ M1*
$= 4{\cdot}3(03..)(\%)$ ISW	✓	A1	*Sight of 0·957... B1* *allow 0·96 for B1* $4{\cdot}3(03..)(\%)$ ISW A1 but 4(%) is then A0
12. $450 \times 4/3$		M1	Sight of 600 gains M1.
$\times 4/3$		M1	
$= 800$ (acres)		A1	C.A.O.
13. (a) $\frac{60}{360} \times \pi \times 80^2$		M1	
$= 3351\ (m^2)$		A1	Accept answers between 3349 and 3353 inclusive.
13. (b) $\frac{60}{360} \times 2 \times \pi \times 80$	✓	M1	
$= 83{\cdot}7(77..)(m)$	✓	A1	Accept answers between 83·70 and 83·85 inclusive.
(Length of rope =) $83{\cdot}8 + 80 + 80$	✓	M1	F.T. 'their derived 83·8'.
$= 243{\cdot}8$ (m)	✓	A1	
14. (Volume of cone) $\frac{1}{3} \times \pi \times 3^2 \times h$	✓	B1	Correctly substituted (with their 'height' notation) Implied by $3\pi h$ or $9{\cdot}42h$ to $9{\cdot}43h$ *(*also $18{\cdot}84h$ to $18{\cdot}86h$*)*
(Volume of sphere) 36π	✓	B1	Implied by 113·0 to 113·2 inclusive.
(Total volume) $6\pi h + 36\pi$ or $18{\cdot}85h + 113.1$	✓	B1	For F.T. 'cone volume' must be in terms of *h.* F.T. 2 × 'their cone volume' + 'their sphere volume'.
$6\pi h + 36\pi = 245$	✓	M1	F.T. 'their total volume' only if it is expressed as two terms one of which contains '*h*'.
$h = \frac{245 - 36\pi}{6\pi}$	✓	A1	Correctly making *h* the subject of their equation.
$= 7$(cm)	✓	A1	
(Overall length =) 20(cm)	✓	A1 (7)	F.T. 2 × 'their 7' + 6.
Alternative method			
(Volume of cone) $\frac{1}{3} \times \pi \times 3^2 \times h$	✓	B1	Correctly substituted (with their 'height' notation) Implied by $3\pi h$ or $9{\cdot}42h$ to $9{\cdot}43h$ *(*also $18{\cdot}84h$ to $18{\cdot}86h$*)*
(Volume of sphere) 36π	✓	B1	Implied by 113·0 to 113·2 inclusive.
(Total volume of **2** cones) 131·9	✓	B1	Must be TWO cones F.T. 245 – 'their sphere volume'.
$\frac{1}{3} \times \pi \times 3^2 \times h = 66$ or $2 \times \frac{1}{3} \times \pi \times 3^2 \times h = 131.9$	✓	M1	Implied by $9{\cdot}42h = 66$ or $18{\cdot}85h = 131{\cdot}9$ F.T. 'their 66' and 'their $9{\cdot}42h$ '.
$h = \frac{131{\cdot}9}{18{\cdot}85}$ or $\frac{66}{9{\cdot}42}$	✓	A1	
$= 7$(cm)	✓	A1	
(Overall length =) 20(cm)	✓	A1 (7)	F.T. 2 × 'their 7' + 6.

UNIT 2 - FOUNDATION TIER

2013 June UNIT 2 (Non calculator) Foundation Tier	Marks	FINAL MARK SCHEME Comments
1.(a)(i) Sixty seven thousand (and) five hundred and thirty	B1	
1.(a)(ii) 8034	B1	
1.(b) (i) 31, 49 OR 40, 40	B1	Do not accept 40 on its own.
1.(b) (ii) 11	B1	
1.(b) (iii) 42	B1	
1.(b) (iv) 25	B1	
1.(b) (v) 64	B1	B0 for 8^2
1.(b) (vi) 39	B1	
1. (c) (i) 6800	B1	
1. (c)(ii) 7000	B1	
2. Weight of male (65kg) 650mg 65g 65mg Vol. of a bucket 450 litres 45ml 4.5 cm^3 (4.5litres) Cardiff to London 240cm 24km 240mm (240km) Height of woman 170m 1700cm (170cm) 170mm	✓ B4	B1 for each correct answer
3. 1,2,3,3,3,4 arranged in any sectors, but 1 per sector.  	✓ B4	B1 for only one each of 1 and 2 B2 for three 3s B1 for one 4 B0 for 1, 2, 3, 4 and 2 blank sections B0 for 1, 2, 3, 4, 5, 6.
4. (a) (i) Subtract 4 from the previous term (ii) Divide the previous term by 3	B1 B1	Accept −4. B0 for '4 numbers more'. B0 for n – 4 Accept ÷3. B0 for n/3.
4. (b) (x=) 11	B1	Accept embedded answers, 11 + 3 = 14
Parts (i) – (ii) marked at the same time 4. (c) (i) 18 (ii) e.g. difference go up by 1 (each time) add one more each time add 1 extra on each time	 B1 B1	
5. (a) Rhombus Rectangle Kite	B1 B1 B1	Note that shapes are removed.
5. (b) 	B2	B1 for 2 correct and up to 2 incorrect

2013 June UNIT 2 (Non calculator) Foundation Tier	Marks	FINAL MARK SCHEME Comments
6.	✓	
Reading at the end of the period: 65197		
Reading at the beginning of the period: 64947		
Number of units used: 250	B1	
Cost of the units in £: 75.00	B2	F.T. their number of units in £. B1 for answer in pence.
Standing charge for the 3 months: 25.34		
Total cost: 100.34	B1	F.T. their cost of units + 25.34 If any entry is blank, look in the work area.
7. (a) $6x = 12$ $x = 2$	B1 B1	Accept embedded answers, $6\times2 - 5 = 7$ F.T. $6x$ = constant.
7. (b) $a - b$	B2	B1 for either in an expression. B2 for $1a - 1b$ B1 for $a + -b$ B1 for a and $-b$ given separately but not as $a-b$.
7. (c) 4	B1	B0 for $4\times4\times4$ OR 4^3.
7. (d) $7/8 - 2/8$ $= 5/8$	M1 A1	OR equivalent, e.g. 20/32. A0 for incorrect reductions. Allow decimals or %s, e.g. (0).875 – (0).25 = (0).625
7. (e) -1	B1	C.A.O. B0 for –6/6 etc
8.(a) Enlargement scale factor 3 Correct position	B2 B1	B1 for at least 3 lines correct
8.(b) Correct reflection	B2	B1 Reflect in any horizontal line or in x=2, OR the line y=2 seen
9. Saving 5.50, 5.50, 5.50 5.50 5.50, 5.50, 5.50 5.50 5.50, 3.60, 3.60 3.60 3.60, 3.60, 2.40 2.40 2.40, 2.40, 2.40 2.40 Saves 19.40	✓ B2 B1 B1 B1 B1	First correct example and the saving Final two examples F.T. for 1 error.
		SC2 for finding total cost 7×£5.50 = (£)38.50 4×£3.60 = (£)14.40 4×£2.40 = (£) 9.60 Total = (£)62.50 (£62.50) and subtracting the cost of at least one bottle. **SC1** for same but incorrect total cost.
Look for • Spelling • Clarity of text explanations • The use of notation – watch for '=','£', 'p' being used appropriately.	QWC 2	
QWC2: Candidates will be expected to • present work clearly, with words explaining their processes or steps AND • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer		QWC2 Presents material in a coherent and logical manner, using acceptable mathematical form, and with few if any errors in spelling, punctuation and grammar.
QWC1: Candidates will be expected to • present work clearly, with words explaining their processes or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer		QWC1 Presents material in a coherent and logical manner but with some errors in use of mathematical form, spelling, punctuation or grammar OR evident weaknesses in organisation of material but 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 or grammar.

2013 June UNIT 2 (Non calculator) Foundation Tier	Marks	FINAL MARK SCHEME Comments
	✓	
10. (Saves each week = 0.12×140) (£)16.8(0) (Reduced computer cost =) 340×0.85 OR 340 - 340×0.15 (£)289	B1 M1 A1	or (6×16.80 =) 100.8(0) Or equivalent full method
Considers £210 already saved in an appropriate calculation	S1	e.g. 'their 289' – 210 (=79), or 340 – 210 (=130), or 210 + 'their 100.8(0)'
Considers the time period of savings, may be with the extra money needed e.g. 6×16.80 (=100.80), 6×17 (=102), 5×17 (= 85), 5×16.80 (=84), 79÷6 (=13…), 79 ÷16.80 (about 4.7), 79÷17 (about 4.6), or equivalent methods including estimation(s)	S1	FT their evaluations of '0.12×140' and '340×0.85'
Interpretation: e.g. 'Yes, enough time to save', 'Harley is able to save enough in the time'	E1	Do not FT for answers stating 'No' Award of E1 depends on M1 and S2 and sight of either 16.8(0) **or** 289
11.(a) Sight of (3), 8, 12, 16, 18, 20 OR 10, 20, 30, 40, 50, 60	B1	Cumulative totals FT both their cumulative totals for shots on target
3/10, 8/20, 12/30, 16/40, 18/50, 20/60 0.3, 0.4, 0.4, 0.4, 0.36, 0.33 (not 0.3)	M1 A2	Expressed as fractions, from both cumulative Conversion to decimals. A1 for any 4 correct conversions
All their 6 points plotted accurately	P1	FT their cumulative decimals Do not award if 'bars' are drawn
11.(b) 'Yes' with reason, e.g. 'all around the same' or ' between 0.3 and 0.4' or '0.3(3..)' stated as an estimate, **OR** 'No' with reason, e.g. 'still swing in results', 'results still changing'	E1	Must FT as an interpretation of stability from cumulative totals used to create the graph in (a)

Unit 2 Higher Tier June 2013	Marks	FINAL MARK SCHEME Comments
1. Indication 100cm = 1m AND 1000m = 1km with intention to multiply, hence sight of digits 756 in a number >0.0756 7560 (cm)	M1 A1	 If units are given they must be correct
2.(a) Enlargement scale factor 3 Correct position	B2 B1	B1 for at least 3 lines correct
2.(b) Correct rotation	B2	B1 for clockwise through 90°
2.(c) Correct reflection	B2	B1 Reflect in any horizontal (line) or in x=2, OR the line y=2 seen
3. (Saves each week = 0.12×140) (£)16.8(0) (Reduced computer cost =) 340×0.85 OR 340 - 340×0.15 (£)289 Considers £210 already saved in an appropriate calculation Considers the time period of savings, may be with the extra money needed e.g. 6×16.80 (=100.80), 6×17 (=102), 5×17 (= 85), 5×16.80 (=84), 79÷6 (=13…), 79 ÷16.80 (about 4.7), 79÷17 (about 4.6), or equivalent methods including estimation(s) Interpretation: e.g. 'Yes, enough time to save', 'Harley is able to save enough in the time' 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	B1 M1 A1 S1 S1 E1 QWC 2	or (6×16.80 =) 100.8(0) Or equivalent full method e.g. 'their 289' – 210 (=79), or 340 – 210 (=130), or 210 + 'their 100.8(0)' FT their evaluations of '0.12×140' and '340×0.85' Do not FT for answers stating 'No' Award of E1 depends on M1 and S2 and sight of either 16.8(0) **or** 289 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. QWC1 Presents relevant material in a coherent and logical manner but with some errors in use of mathematical form, spelling, punctuation or grammar OR evident weaknesses in organisation of material but 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 or grammar.
4.(a)(i) Method that produces at least 2 correct prime factors Sight of correct factors (3, 3, 3, 3, 7, 7) $3^4 \times 7^2$ (ISW)	M1 A1 B1	Before 2nd error Ignore 1s seen FT their factors (with at least 1 index >1 used). Do not ignore ones within the product
4.(a) (ii) Explanation, e.g. all even powers, 63^2	E1	Do not accept general definitions of square numbers
4(b) 12n - 4	B2	B1 for sight of 12n

Unit 2 Higher Tier June 2013	Marks	FINAL MARK SCHEME Comments
5.(a) $y \geq 0$ or $y > 0$ $x \leq 0$ or $x < 0$ For straight line: c = 2 Gradient is 2/8 (= ¼) $y \leq x/4 + 2$ or $y < x/4 + 2$ or equivalent	B1 B1 B1 B1 B2	 Do not ISW, but then FT gradients of – ¼ , 4 and -4 Accept unsimplified gradient for B2 or B1 FT their gradient (± ¼, ±4) for m, do not FT c B1 for y… x/4 + 2 or equivalent, with >, ≥ or =
5.(b) Method to solve to eliminate one variable One variable correct Method to find the second variable Second variable correct	M1 A1 m1 A1	Allow 1 error but not in the equated variable FT their 1st variable provided M1 awarded **x = 2** **y = ½** Unsupported answer only is no marks.
6.(a) Sight of (3), 8, 12, 16, 18, 20 OR 10, 20, 30, 40, 50, 60 3/10, 8/20, 12/30, 16/40, 18/50, 20/60 0.3, 0.4, 0.4, 0.4, 0.36, 0.33 All their 6 points plotted accurately	B1 M1 A2 P1	Cumulative totals FT both their cumulative totals for shots on target Expressed as fractions, from both cumulative Conversion to decimals. A1 for any 4 correct conversions FT their cumulative decimals Do not award if 'bars' are drawn
6.(b) 'Yes' with reason, e.g. 'all around the same' or ' between 0.3 and 0.4' or '0.3(3..)' stated as an estimate, **OR** 'No' with reason, e.g. 'still swing in results', 'results still changing'	E1	Must FT as an interpretation of stability from cumulative totals used to create the graph in (a)
7.(a) $f - 5 = 3g^2$ $g^2 = (f - 5)/3$ $g = (\pm)\sqrt{\{(f - 5)/3\}}$	 B1 B1 B1	Accept appropriate negative equivalents FT until 2nd error Quotient all divided by 3 Square root must be clearly over complete quotient
7.(b) $8x^2 + 20xy - 6xy - 15y^2$ $8x^2 + 14xy - 15y^2$ (ISW)	B2 B1	B1 for any 2 of the 3 or 4 terms correct FT from B1 for equivalent level of difficulty
8.(a)10x =7.5252.. and 1000x= 752.52…with attempt to subtract 745/990 (ISW)	M1 A1	Or equivalent Watch for slips in the denominator! A final answer of 74.5/99 is M1, A0
8.(b) $\pi^2(\sqrt{(4\times5)} - \sqrt{5})^2$ OR $20\pi^2 - 2\pi^2\sqrt{20}\sqrt{5} + 5\pi^2$ $\pi^2(\sqrt{5})^2$ middle term (±) $20\pi^2$ $5\pi^2$	M1 M1 A1	 If error is not considering π^2 correctly, leading to answers of 5π or 5, then award SC1
8.(c)$1/20^3$or 20^{-3} or 8000^{-1} or $1/\sqrt{64\ 000\ 000}$ or $1/ 64\ 000\ 000^{1/2}$ 1/8000 (ISW)	M1 A1	
9.(a) Correct sketch (shift down) (0, -12) indicated on the correct sketch	B1 B1	 Accept -12 appropriately indicated. Depends on the first B1
9.(b)(i) Sketch with shift to the left Passes through (0,0) and(-6,0) with (-6,0) indicated on the correct sketch (ii) -9	B1 B1 B1	 Depends on the first B1 Accept -6 appropriately indicated Accept FT from their last sketch, but do not accept spurious values. If given in coordinate notation mark the y value.
9.(c) $y = x^2 - 9$ selected	B1	
10. Sight of a parallel line from the centre OR perpendicular line through the centre to each of the parallel lines <QOR = x+y Statement: Angle and the centre is twice the angle at the circumference **AND** <QAR = (x+y)/2 or equivalent	S1 B1 B2	S1 for statement of doing this, OR statement 'alternate angles' May be indicated on the diagram May be indicated on the diagram B1 for <QAR = (x+y)/2 or equivalent *An unsupported answer of <QAR = (x+y)/2 or equivalent is awarded B3*
11. Use of 1 – P(no white) OR other **complete** method = 1 – 5/21 x 4/20 = 20/21	S1 M1 A1	P(WW') + P(W'W) + P(WW) Calculations showing correct sum of products of probabilities without replacement CAO. Must be in its simplest form

2013 June UNIT 3 (Calculator allowed) Foundation Tier	Marks	FINAL MARK SCHEME Comments
Parts (a)(i) & (ii) marked at the same time 1. (a) (i) 4.56 (potatoes) 10.08 (cereal) 7.56 (milk) 22.2(0)	 B1 B1 B1 B1	 F.T. their figures for 1 error Unsupported 22.2(0) gets B4.
1. (a) (ii) For example, 10% = (£) 2.22 5% = (£) 1.11	M1 A1	Any valid method F.T. their (a)(i). Ignore extra decimal places in their answer. If (£)1.11 not given, then (£) 21.09 gains M1 A1
1. (b) 9630	B1	
1. (c) (i) 8.5	B1	Extra zeros get B0, e.g. 8.50 gets B0.
1. (c) (ii) 8	B1	Extra zeros get B0, e.g. 8.0 gets B0
1. (d) 18 + 32 = 50	M1 A1	Correct substitution. B1 for 3×6 + 4×8 gets M1, A0. Substitutions like 36+48 OR 18A +32B get M0, A0.
Parts (a) – (b) marked at the same time 2. (a) Premier 8, Championship 11, Other 7, None 4 Both axes labelled, e.g. frequency along one axis and P(remier), C(hampionship), O(ther),N(one) along other axis. Anywhere within the base (inc.) of the corresponding bar. Uniform scale for the frequency axis starting at 0. Four bars at correct heights. Can be in any order. Bars must be of equal width. Penalise –1 for each different width bar. (b) Championship OR C	✓ B2 B2 B2 B1	Part (a) only ✓ B1 for any two/three correct frequencies If frequencies score 0, then give B1 for all 4 correct tallies. B1 if no scale but allow one square to represent 1 OR B1 if not labelled as 'frequency' or similar. If frequency scale starts with 1 at the top of the first square the starting at 0 will be implied for this axis. Condone frequency numbers alongside squares instead of at the top of squares. F.T. their table of frequencies B1 for any 2 or 3 correct bars on F.T. If no frequencies given in their working, penalise -1 for each incorrect frequency on their bars up to -4 (First and third B2s) F.T. Accept 11 and C or Championship, but B0 for 11 only **F.T. their frequencies**
3. Evidence of square counting 69 – 73 345 – 365	M1 A1 B1	 F.T. 5 × 'their area'
4. Selvy must have 1 and 3 (4) Megan must now have 2 and 6 (8) David must now have 4 and 7 (11) Roberta must now have 5 and 10 (15)	✓ B1 B1 B1 B1	F.T. wrong choices, but cards can only be used once.
Use overlay 5. (a) Angle BAD (67º) AD = 7.5cm Angle ABC (106º) BC = 10cm	 B1 B1 B1 B1	 Allow ± 2º Allow ±2mm Allow ± 2º Allow ±2mm B4 only if quadrilateral is completed.
5. (b) 3 arcs for bisector and the line	B2	B1 for the first arc crossing both arms. Watch out for equal arcs from P and R.

2013 June UNIT 3 (Calculator allowed) Foundation Tier	Marks	FINAL MARK SCHEME Comments
6. (a) 2.31	B2	B1 for 2.30(71805857...) All places given must be correct.
6. (b) 39.10	B2	B1 for 39.1(02183...) All places given must be correct.
7. (a) 491	B1	
7. (b) Sum of the numbers (1784) Sum/8 223	M1 M1 A1	For attempt to add the numbers For a division by 8 of a number in the range 1200 − 2300 C.A.O.
7. (c) (19 74 122) <u>162 206</u> (272 419 510) 184	M1 A1	For ordering the numbers in descending or ascending order. OR showing 162 and 206 only.
8. (a) 55 (miles)	B1	
8. (b) 35 (miles)	B1	
8. (c) 48 (minutes)	B1	
8. (d) Correct line drawn to (14:18, 48)	B2	B1 for a line to (..., 48) and later than 13:00 OR for a line to (14:18, ...). (14:18, 48) without the line gets B1.
9. **<u>Use angle measuring tool</u>** 3 or 4 angles correct and correctly labelled. 3 or 4 angles correct, labels not fully correct. 2 angles correct and correctly labelled. 2 angles correct, labels not fully correct. 1 angle correct and correctly labelled. OR <u>If 0 OR 1 for their diagram or no diagram,</u> 360/240 Angles are 165, 105, 57 and 33	 B4 OR B3 B3 B2 B1 M1 A1	 Correct labels (Words NOT the frequency OR angle). 3 correct labels is enough. If only B1 is scored for the diagram, and all the angles given correctly, then cancel the B1 and award M1, A1 for 2 marks. If B0 scored for the diagram, check the angles and the method to see if the M1 and the A1 can be awarded. (1 is) 1½ ° gets the M1. OR SC1 for all correct percentages: 45.8, 29.2, 15.8, 9.2
10. EITHER ¼ + ⅓ M1 = 7/12 A1 leaving 1 – 7/12 M1 = 5/12 A1 OR ¼ of (£)1200 = (£)300 ⅓ of (£)1200 = (£)400 Leaving 500 5/12	✓ B1 B1 M1 A1	 M1 for implementing the addition of the fractions by a correct method. This M1 is F.T. in both methods C.A.O.
Look for • Spelling • Clarity of text explanations, e.g. food, rent • The use of notation – watch for '=','£', 'p' being used appropriately. QWC2: Candidates will be expected to • present work clearly, with words explaining their processes 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 their processes or steps OR • make few if any mistakes in mathematical form, spelling, punctuation and grammar and include units in their final answer	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. QWC1 Presents relevant material in a coherent and logical manner but with some errors in use of mathematical form, spelling, punctuation or grammar. OR Evident weaknesses in organisation of material but 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.

2013 June UNIT 3 (Calculator allowed) Foundation Tier	Marks	FINAL MARK SCHEME Comments
All parts (a) – (d) marked at the same time **Use Overlay**		
11. (a) All points correctly plotted	B2	Mark intention B1 for any 4 points correctly plotted
11. (b) Reasonable (straight) line of best fit	B1	In an appropriate direction, fit for purpose, with some points above and some points below the straight line. Intention to be 'straight', accept without a ruler Do not accept line drawn corner to corner
11. (c) Positive	B1	Do not accept descriptions
11. (d) Their maximum width read from their line of best fit for a maximum length of 5cm	B1	Accuracy of reading within 1 square small If no line of best fit then B0
12. (Cost of torch and battery) (£)4.14	B1	
(Cost of battery =) 4(.)14/9	M2	FT their 4.14 provided 20–15.86 attempted M1 for realising this is '9× the cost of the battery', e.g. $x + 8x = 4(.)14$, or $9\times\ldots. = 4(.)14$
46(p) or (£)0.46	A1	If units are given they must be correct (B1 and) also possible SC1 from ÷8 leading to an answer of 51(.75p), 52(p), (£)0.51(75) or (£)0.52
	✓	
13. Evidence of 240×1.4/100 or equivalent	M1	Accept 12×20 for 240
+ 240 (=243.36)	m1	Accept 12×20 for 240 *OR award M1, m1 for 240 × 1.014*
+ 80	M1	Accept 4×20 for 80. FT for idea to add 80 to an amount > 'their 12×20'
(£)323.36	A1	CAO. Accept (£)323. Mark final answer. If units are given they must be correct
14. $6x – 21 = 2x + 9$	B1	Clearing bracket correctly F.T. until 2nd error 6x – 21 need not be in an equation.
$4x = 30$	B1	Gathering terms on both sides
$x = 30/4$ OR 7½ OR 7.5	B1	F.T. $ax = b$ ($a \neq 1$)
15(a). Perpendicular bisector of BC ± 2°	B1	
Arc centre A with radius 4cm +2mm (As on the overlay)	B1	
Correct region identified	B1	FT for a similar region (i.e. correct but outside tolerances)
15(b). Drawing the line BD OR considering the area of one of 2 right angled triangles ABD or BCD	S1	
Area ΔABD = ½ ×12 ×5 OR Area ΔBCD = ½ ×7.8×10.4	M1	For ½ base×height used for one of the right angled triangles
Area ΔABD = 30 (cm^2)	A1	
Area ΔBCD = 40.56 (cm^2)	A1	
Sum of their 2 areas evaluated 70.56 (cm^2)	A1	F.T. provided M1 awarded

Higher Tier GCSE Mathematics Unit 3 June 2013	Marks	FINAL MARK SCHEME Comments
1. (Cost of torch and battery) (£)4.14 (Cost of battery =) 4(.)14/9 46(p) or (£)0.46	B1 M2 A1	 FT their 4.14 provided 20-15.86 attempted M1 for realising this is '9× the cost of the battery', e.g. $x + 8x = 4(.)14$, or $9\times\ldots. = 4(.)14$ If units are given they must be correct (B1 and) also possible SC1 from ÷8 leading to an answer of 51(.75p), 52(p), (£)0.51(75) or (£)0.52
2.(a) All points correctly plotted	B2	Mark intention B1 for any 4 points correctly plotted
2.(b) Reasonable (straight) line of best fit	B1	In an appropriate direction, fit for purpose, with some points above and some points below the straight line. Intention to be 'straight', accept without a ruler Do not accept line drawn corner to corner
2.(c) Positive	B1	Do not accept descriptions
2.(d) Their maximum width read from their line of best fit for a maximum length of 5cm	B1	Accuracy of reading within 1 square small If no line of best fit then B0
3.(a) $12x(x - 4)$ (ISW)	B2	B1 for 1 slip inside bracket or partially factorised,
3.(b) -250	B1	CAO
3.(c) E.g. (25 - - 3)/56 28/56 0.5	M1 A1 A1	 Decimal answer required *If no marks:SC1 for answer 0.392857… rounded or truncated from (25-3)/56, or* *for 28/'their 56' where 8×7 has not been evaluated correctly, with the answer evaluated correctly as a decimal*
4. *Iona* (a)(i) Mid points (2.5,) 7.5, 12.5, 17.5 (, 22.5) (7.5×5 + 12.5×9 + 17.5×17) (=447.5) /31 14(.435….°C)	 B1 M1 m1 A1	 FT their midpoints if within or at bounds FT their Σfx ÷ 31 Ignore further rounding
4(a)(ii) Explanation, e.g. 'most common', 'more data than in other groups'	E1	
4(a)(iii) 15 (°C)	B1	Accept 14.9(99…)
4.(b)(i) Reason, e.g. 'uses all data', 'mean is a single value (whereas the mode is in a group)'	E1	Do not accept 'more accurate' without a reason
4.(b)(ii) Reason, e.g. 'range doesn't tell you how hot it is', 'you don't know if it is cold looking at the range'	E1	Accept 'extreme value might impact on the range more than on the mean' Do not accept 'mean gives you one value where as the range does not', 'range only considers largest and smallest values'
4.(c) Correct frequency polygon	B2	Ignore bars drawn as working. B1 correct except that the polygon has been translated by 0.5, OR B1 4 of the 5 points plotted correctly and a polygon formed, OR B1 for the plots at 7.5, 12.5 and 17.5 plotted correctly and these plots joined by straight lines (ignore extra spurious lines), OR B1 for correct plots but not joined or joined by a curve

Higher Tier GCSE Mathematics Unit 3 June 2013	Marks	FINAL MARK SCHEME Comments
5. Evidence of 240×1.4/100 or equivalent + 240 (=243.36) + 80 (£)323.36 Look for • organised layout • spelling • clarity of text explanations, • the use of notation and units 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	M1 m1 M1 A1 QWC 2	Accept 12×20 for 240 Accept 12×20 for 240 *OR award M1, m1 for 240 × 1.014* Accept 4×20 for 80. FT for idea to add 80 to an amount > 'their 12×20' CAO. Accept (£)323. Mark final answer. If units are given they must be correct 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. QWC1 Presents relevant material in a coherent and logical manner but with some errors in use of mathematical form, spelling, punctuation or grammar . OR Evident weaknesses in organisation of material but 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.
6.(a) Perpendicular bisector of BC ±2° and ±2mm Arc centre A with radius 4cm ±2mm Correct region identified	B1 B1 B1	 FT for a similar region (i.e. correct but outside tolerances)
6.(b) Drawing the line BD OR considering the area of one of 2 right angled triangles ABD or BCD Area ΔABD = ½ ×12 ×5 OR Area ΔBCD = ½ ×7.8×10.4 Area ΔABD = 30 (cm^2) Area ΔBCD = 40.56 (cm^2) Sum of their 2 areas evaluated 70.56 (cm^2)	S1 M1 A1 A1 A1	 For ½ base×height used for one of the right angled triangles F.T. provided M1 awarded
7.(a) x/1.5= 3.6/2 OR x = (3.6/2)× 1.5 OR x = 1.8× 1.5 x = 2.7 (cm) y/4.5 = 2/3.6 OR y = (2/3.6) ×4.5 OR y = 4.5÷1.8 y = 2.5 (cm)	M1 A1 M1 A1	
7.(b) In either order Option: 'Length of the third side', 'another side' Option: 'Included angle', 'size of angle between two sides'	E1 E1	Accept 'SSS' Do not accept 'all the sides are different lengths' Must refer to 'included' angle in some way. Accept 'SAS' *Read descriptions, they must not contradict!*

Higher Tier GCSE Mathematics Unit 3 June 2013	Marks	FINAL MARK SCHEME Comments
8.(a) $(2x + 5)(3x – 5)$	B2	B1 for $(2x … 5)(3x … 5)$
8.(b) Method of clearing all 3 fractions Correctly collecting like terms LHS, i.e. $(16x + 2 – 12x – 21 = 3$ leading to) $4x – 19 = 3$ $x = 22/4$ or equivalent (11/2 or 5.5 or 5 ½)	M2 A1 A1	M1 for clearing 2 of the 3 fractions. 'Clearing' implies that the denominator is 1 FT provided at least M1 already awarded FT provided at least M1 already awarded Mark their final answer *If no marks SC1 for sight of (4x-19)/6*
9.(a) Strategy, sketch with tanker to boat (3.2km) and lighthouse to boat (4.5km)perpendicular $d^2 = 3.2^2 + 4.5^2$ 30.49 Distance 5.5(2… km)	S1 M1 A1 A1	 FT from their sketch interpretation *If no marks, 45 as hypotenuse, then SC1 for an answer of 3.16…(km)* *Do not accept scale drawings*
9.(b) Calculating an angle in their right angled triangle, e.g. tanBOL=4.5/3.2 or sinBOL=4.5/5.5 or CosBOL=3.2/5.5, OR accept tanBLO=3.2/4.5, or sinBLO=3.2/5.5, or CosBLO=4.5/5.5 Appropriate sketch with an angle of 54(°) to 55(°) Bearing (rounds to) 305(°) to 306(°)	M1 A2 B1	FT their distance '5.5'  OR for appropriate angle that if continued would give the correct bearing (see sketch above) A1 for $\tan^{-1}1.4…$ or $\sin^{-1}0.8…$ or $\cos^{-1}0.58..$, OR answer 35(°) to 36(°) or inappropriate 54(°) to 55(°) CAO *Do not accept scale drawings*
10. $x(x + 5) = 2100$ or $x^2 + 5x – 2100 = 0$ $x = \{-5 \pm \sqrt{(5^2 - 4\times1\times-2100)}\}/ 2$ $= (-5 \pm \sqrt{8425})/ 2$ Width 43.4 (cm)	S1 M1 A1 A1	Brackets must be intended Allow 1 slip in substitution. FT for their quadratic with no zero terms and with sight of 2100 and 5 in the equation FT from S0, M1 CAO. Ignore -48.4 as not required Must be from evidence of using the quadratic formula
11.Use of ½ absinC ½ ×3.4×2.7×sin123° 3.8(49…cm^2)	M1 A1 A1	 Accept 3.9 or 4(cm^2) from appropriate working
12.(a)(i) Idea of frequency density × 10 (2+4+6+10+8+10) × 10 400 (people)	S1 M1 A1	 Allow 1 error CAO. Must be from correct working for 2nd August SC1 for an answer of 400 from reading 2nd September
12.(b)Reason, e.g. 'only know total time', '**only** shows the amount of time'	E1	
12.(c) Implies 'Grant correct' AND reason, e.g. 'can only estimate from the group', 'yes as the histogram only gives 120 to 140 minutes'	E1	
12.(d) Frequency densities: 3, 8, 9, 10, 9,6.5, 11, 3.5 Correct histogram	M2 A1	Watch last 3.5 height is of width 140 - 180 M1 for any 4 correct frequency densities CAO
13.(a) Calculation of at least 3 of the coordinates Plotting at least 5 correct points accurately Correct curve through all 6 correct points	B1 P1 C1	(-2,0) (-1,4) (0,6) (1,6) (2,4) (3,0) Do not accept drawn with straight lines, or a 'flat' part
13.(b)(i) -2 and 3	B1	FT their curve provided it crosses y=0 at least twice, all values must be given
13.(b)(ii) Considering y = 2 Two x-values from their graph	M1 A1	FT their curve FT for all possible values, provided at least 2solutions
13.(c) Split into areas by ordinates given & attempt to sum Use of (0,6) (1,6) (2,4) (3,0) Correct substitution into trapezium rule 13	M1 B1 m1 A1	FT from (a) Or correct calculations shown for the area (6+5+2)

Higher Tier GCSE Mathematics Unit 3 June 2013	Marks	FINAL MARK SCHEME Comments
14. Correct placement of <ABD= 134° $AD^2 = 5.6^2 + 26.8^2 - 2\times5.6\times26.8\times\cos134$ $AD^2 = 958.1(0865\ldots)$ AD = 30.9(533… m) or 31(m)	S1 M1 A1 A1	Or 46° if appropriate for their alternative calculations FT their 134° provided it is an obtuse angle for possible M1 and final A1 only (use of 140° leads to 31.297…)
15. 195° or 345° Then: 345° or 195° with no other values	B1 B1	Answers from calculations that strictly round or truncate to those given FT 540 – their first answer. Do not FT from multiples of 90° *Accept sight of -15° as working not as another value answer*

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