General Certificate of Secondary Education Tystysgrif Gyffredinol Addysg Uwchradd

MARKING SCHEMES

SUMMER 2006

MATHEMATICS
(FOUNDATION TIER)

GCSE MATHEMATICS

FOUNDATION TIER

2006 Summer Paper 1 (Non calculator) Foundation Tier		Marks	FINAL MARK SCHEME Comments
1.	*(a)* (i) 329	B1	CAO In (a) accept answers written in words.
	(ii) 386	B1	CAO
	(b) (i) 127	B1	CAO
	(ii) 13	B1	CAO
	(iii) 166	B1	CAO
	(c) (£)150	B1	CAO
	150 – 112	M1	
	(£)38 3800p	A1	FT A0 for 38p
	(d) $\frac{20}{100} \times 200$	M1	
	(£)40 ISW	A1	CAO
		10	
2.	*(a)* Correct circle	B1	$\pm$2mm Compasses must be used
	(b) DC / CD	B1	
	BC / CB	B1	
	(c) 7·6	B1	$\pm$ 2mm Accept (3 $\pm$ 0.1)inches when the units are clearly shown.
		4	
3.	*(a)* 12 8 14	B1	CAO Give this B1 if table is blank but graph is correct.
	Labels	B1	Canteen, hall,at home and scale required
	Uniform scale	M1	
	Correct bars	A1	FT from table.
	(b) No scale, no numbers. Months incorrect.	E1	
		5	
4.	*(a)* 16 squares shaded	B1	CAO
	(b) 25	B1	CAO
	(c) $^{6}/_{12}$ $^{15}/_{30}$	B2	B1 for 1 correct or 1 correct and 1 incorrect or 2 correct and 1 incorrect.
		4	
5.	*(a)* (i) 19	B1	CAO
	(ii) 3	B1	CAO
	(b) Plot A(2,4)	P1	CAO Reversed coordinates P0
	Plot B(8,10)	P1	CAO Reversed coordinates P0
	(10,6)	B1	CAO Reversed coordinates B0
		5	

6.	*(a)* 35,000,000 (35000000)	B1	CAO
	(b) (i) 6700	B1	CAO
	(ii) 7000	B1	CAO
	(c) Any two of 1 2 11 22	B1	
	(d) 200 × 10 198 × 10 200 × 12	M1	Working must be shown
	2000 ISW 1980 ISW 2400 ISW	A1	
	(e) 8	B1	CAO B0 for 8 x 8 or 8^2 or 8 x 8 = 64
	(f) 3 × 4 or 84/7	M1	
	12	A1	CAO
		9	
7.	*(a)* (i) Correct line	B1	CAO
	(ii) Correct lines	B1	CAO
	(b) Correct square	B1	CAO
		3	
8.	7 × 12 OR 7+12+7+12	M1	
	Area = 84	A1	CAO
	Perimeter = 38	A1	CAO
	cm^2 AND cm	U1	Both are required. SC1 for answers only which are reversed.
		4	
9.	*(a)* 469		
	36	M1	For place value
	2814		
	14070	A1	C.A.O.
	16884	A1	FT for one error
	(b) 36	M1	For 879 divided by 24, using any correct method
	24)879		
	72	A1	
	159		
	144		
	15		
	36	A1	FT for one error
	15	A1	
		7	
10.	*(a)* 34	B1	± 2°
	127	B1	± 2°
	(b) 180 – 90 – 54 OR 90 – 54	M1	Any correct method
	= 36 (°)	A1	C.A.O.
	(c) 180 – 110 = 70	B1	For finding 4^{th} angle, check the diagram.
	360 – 73 – 136 – 70	M1	Angle sum of quadrilateral. Note that 180-209+100 is equiv.
	= 81 (°)	A1	FT 'their 70
			Answer only 70 gets B1
		7	

11. *(a)* 08 *(b)* 3·83 *(c)* 3	B1 B1 B1 **3**	C.A.O. or equivalent e.g. 8/100 but NOT 8% C.A.O. C.A.O. B0 for 3 x 3 x 3 or 3^3	
12. A B D C	B3 **3**	All correct Accept correct names, cone, cuboid, hexagon, cylinder. B2 for any three correct B1 for any two correct	
13. *(a)* .. .. 14 16 .. .. 13 15 8 10 7 9 *(b)* $\frac{14}{20}$ (ISW) OR .7 OR 70% <u>F.T. the numerator from their table even if they have not entered any new numbers into the table.</u>	B2 B2 4	C.A.O. B1 for any 3 correct rows or columns. F.T. their table B1 for a numerator of 14 in a fraction less than 1. B1 for the 20.	NOTES (Use throughout): There is no F.T. for any probabilities outside the range 0 to 1 inclusive. Penalise –1 use of words such as "14 out of 20", "14 in 20" OR "14:20". When fraction AND wrong notation seen, DO NOT penalise wrong notation. Do not penalise incorrect reduction of fractions.
14. *(a)* 5, –2 *(b)* (i) 7 (ii) 3 (iii) 24 *(c)* (i) 14b (ii) $8x - 11y$ ISW *(d)* –4	B1 B1 B1 B1 B1 B1 B2 B2 **10**	C.A.O. F.T. 'their 5' – 7 if answer negative. C.A.O. C.A.O. } Accept embedded answers in (i) to (iii) C.A.O. C.A.O. B1 for the 8x OR for the – 11y. Accept 8x+– 11y for 2 marks. B1 for the 16 OR for the – 20. **16a – 20b gets B0**	
15. $\frac{15}{20}, \frac{14}{20}, \frac{13}{20}$ $\left(\frac{3}{5}=\frac{12}{20}\right)$ .75, .7, .65 [.6] OR use a common number such as 600 and change the given fractions to 390, 450, 420 and 360. Therefore $\frac{13}{20}$ is the nearest.	M1 A1 **2**	Unsupported 13/20 gets M0A0. A CORRECT METHOD MUST BE SEEN. Having at least 3 fractions in a suitable form for comparing (e.g. fractions with the same denominator OR to decimals OR to percentages), with at least 2 of the 3 values correct. For 13/20 (or equivalent) AND having all 4 fractions in a correct suitable form for comparison. <u>Proof by diagrams need them to be appropriate for comparing quantities at the 1/20 level of accuracy.</u>	

16. *(a)* Correct image (Allow ± 2mm) *(b)* 38 37·7	B2 B1 **3**	-1 for each incorrect vertex MR –1 for use of a different scale factor (NOT 1)
17. For example, 50, 1600 and 200 Estimate = 400	M1 A1 2	For reasonable estimates that lead to a simple calculation. (cancelling /single digit arithmetic). e.g. (50 x 1577)/200 gets M1 In the range 300 – 500 inclusive. **Calculations from their figures MUST be correct.** Unsupported answers get M0.A0
18. (a) $\frac{n+8}{3}$ OR $(n+8)/3$ ISW (b) – 2, 1, 6 (c) $4x$ 20 (x =) 20/4 (ISW) (= 5)	B2 B2 B1 B1 B1 **7**	Do not penalise extra =x or x= or =n or n= in part (a). Accept (n+8)÷3. B1 for n +8/3 OR n +8÷3 All correct. (–2n, n, 6n gets B0.) B1 for any 1 value for the correct term SC1 for –3, -2, 1 (using n = 0, 1, 2) SC1 for $1^2 - 3$, $2^2 - 3$, $3^2 - 3$. C.A.O. for the x terms B2 for –4x = –20 C.A.O. for the constant terms B2 for 4x – 20 = 0 F.T. if of the form ax = b with a≠1 B0 for 20÷4 Stop at the second error. B3 for answer only 5 or embedded 5.
19. Their 074° bearing from Aber Their 217° bearing from Borth Point X.	M1 M1 A1 **3**	± 2° Use overlay (Allow the M marks for dots/crosses which are on the correct bearings, provided they are unambiguously offered). F.T. if at least one M1 and 2 intersecting lines. If the correct point X is unambiguously indicated even without the bearing lines then award M1, M1, A1.
20. x = 38 (°) y = 64 (°)	B1 B1 **2**	C.A.O. FT x + y = 102 (°)
21. *(a)* Idea of ordered pairs plotted. At least 6 plotted correctly, not joined. *(b)* Positive (correlation)	M1 A1 B1 **3**	At least 4 points plotted correctly. Within 1mm of the points on the overlay. Ignore line of best fit. C.A.O.

GCSE Mathematics

Foundation Tier - Paper 2

2006 Summer Paper 2 (Calculator allowed) Foundation Tier	Marks	FINAL MARK SCHEME Comments
1. *(a)* 534	B1	CAO
22·44	B1	CAO
22·08	B1	CAO
660·52	B1	FT for one error
(b) $65 \times 12{\cdot}65 = 822.25$	B1	CAO
$1000 - 65 \times 12{\cdot}65$	M1	
(£)177·75	A1	FT
	7	
2. *(a)* Correct figure	B2	-1 for each error
(b) 52 53 54 55 56 57 58 59	M1 A1	M mark for attempt to add squares.
(c) cube	B1	
parallelogram	B1	
hexagon	B1	
cylinder	B1	
	8	
3. 5½ symbols	B1	
4 symbols	B1	
1¾ symbols	B1	
2¾ symbols	B1	
	4	
4. *(a)* $27 \times 0{\cdot}25 + 12{\cdot}50$	M1	For attempting to multiply and add.
(£)19·25	A1	CAO
(b) $50 - 28 \times 0{\cdot}25$	M1	For attempting to multiply and subtract.
(£)43	A1	CAO Accept embedded answers
	4	
5. *(a)* A C	B2	B1 for 1 correct or 1 correct and 1 incorrect or 2 correct and 1 incorrect
(b) P, U } S, X or { U, P } X, S	B1	
	B1	
	4	
6. *(a)* 2 2 2 2 3 3 4 4 6 8 9	M1	For attempting to order the numbers
Mode 2	B1	CAO
Median 3	A1	CAO
Range 7	B1	CAO
(b) Attempt to add the numbers	M1	
'their sum'/8	m1	
77·25	A1	CAO
	7	

2006 Summer Paper 2 (Calculator allowed) Foundation Tier			Marks	FINAL MARK SCHEME Comments
7.	*(a)*	(£) **8605** (.00)	B1	CAO
	(b)	5 – (2.34 + 1·19)	M1	
		(£)1·47	A1	CAO
	(c)	12 × 750 /100	M1	
		(£)90 ISW	A1	CAO Answer only (£)660 gets M1 A0.
	(d)	20/2·36	M1	***Answer only***
		8	A1	CAO ***8 and incorrect remainder M1 A1 A0***
		(£)1·12	A1	CAO ***8 incorrect remainder correct M1 A0 A1***
			8	
8.	*(a)*	(51 + 5) / 7	M1	
		8	A1	CAO Accept embedded answers.
			B2	B1for 6 or 20 B0 for 6a + 20b
	(b)	(i) 26	B2	B1 for –8 or –3
		(ii) -9		
			6	
9.	*(a)*	AB =13cm **OR** BC = 10cm	B1	± 2mm Use the overlay to check their triangle
		Angle ABC = 65° **AND** BC = 10cm or AB = 13cm	M1	**M1 for attempting to draw a line10cm (or 13cm) ±5mm WITH the included angle 65° ±5°.**
		65° ± 2°, 10 (or 13) ± 2mm **and triangle completed**	A1	A,B and C need not be shown on the triangle. Ignore A,B and C when shown at an incorrect vertex.
	(b)	Plot (-2,-5)	P1	CAO Coordinates reversed P0.
		(-6,4)	B1	CAO Coordinates reversed B0.
			5	
10.		Estimate for the height of the man	B1	1.5m to 2.5m (5ft to 7ft)
		7 equal spaces shown above the man **OR** ht. of man = 2cm ht. of church = 16cm **OR** Ratio 16:2 8:1 2:16 1:8	B1	Allow ± 2mm for the height of man and height of church
		8 x their estimate	M1	
		height of the church	A1	FT for their height. **Answer only no working B0 B0 M0 A0**
			4	

2006 Summer Paper 2 (Calculator allowed) Foundation Tier	Marks	FINAL MARK SCHEME Comments
11. *(a)* (£)204·2(0) – (£)54·6(0) = (£)149·6(0) (£)149·6(0) ÷ (£)37·4(0) = 4 5 days	M1 A1 B1	For the complete method that leads to the number of additional days. F.T. 'their 4'+1. Allow '4 additional days' Must be a whole number of days. OR Candidates may keep adding 37.4 to 54.6. Arithmetical errors may lead to totals ≠ 204.20. The M1, A0 is awarded if they stop within ± 37.4 of 204.20. Then B1 for FT correct number of days based upon their working. Answer only 5 gets M1A1B1 Answer only 4 gets M0A0B0
(b) $\frac{84}{100} \times 67$ = 56·2(8) = 56·3	M1 A1 B1	 **F.T. their answer correct to 1 decimal place**. **Answer only** 56.3 gets M1 A1 B1, 56.2 gets M1 A1 B0 **Partition methods need to have sufficient accuracy to ensure that the complete method is correct. Finding 80% and adding 'a bit' is M0 A0**.
	6	
12. *(a)* Pounds = 1200 × (0)68 = (£)816	M1 A1	 C.A.O. Ignore units. Allow M1 A1 for 81600**p**
(b) Euros = 374/(0)68 = 550 (€)	M1 A1	 C.A.O. Ignore units
	4	
13. In the range 8·8 – 9·2 (cm) OR 88 – 92 (mm) **Units are not required but must be correct if given** × 80 = 7·04 – 7·36 (m) ISW	B1 M1 A1	9 or 90 seen anywhere. **That is 9 OR 90 gets B1, but 9mm or 90cm gets B0**. For correct use of scale F.T. their measurement. Use of a scale other than 80 is M0 A0 Unsupported answers which are a power of 10 times the correct answer e.g. 70.4, 736 get B1 M0 A0.
	3	
14. 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 If 0 OR 1 for their diagram or no diagram, 360/60 Angles are 150, 96, 60 and 54	B4 B3 B3 B2 B1 M1 A1	Use the overlay and allow ± 2°. Correct labels (Words NOT the frequency OR angle)**.** 3 correct labels is enough. Accept labels in the form of a key. If B0 is scored for the diagram, check the angles and the method to see if the M1 and the A1 can be awarded. 1 is 6° gets the M1. If only B1 is scored for the diagram, and all the angles are given correctly, cancel the B1 and award M1 A1. OR SC1 for all percentages: 41·7, 26·7, 16·7, 15 OR rounded or truncated.
	4	

2006 Summer Paper 2 (Calculator allowed) Foundation Tier	Marks	FINAL MARK SCHEME Comments
15.		Do not penalise extra =x or x= or =n or n= in this question. Insertion of words such as x small bars x 6 is penalised –1 once only.
(a) $6x$	B1	C.A.O. Ignore subsequent working in parts (a), (b) and (c).
(b) $x - 11$	B1	C.A.O. Change of letter is penalised –1 once only.
(c) $8(x - 11)$	B1	F.T. $8 \times$ their (b) if (b) is of the form ax+b with $a \neq 0, b \neq 0$. B1 for $8 \times x - 11$ OR $x - 11 \times 8$ in this part. $8x - 11$ gets B0.
(d) $8(x - 11) + 6x$ $8x - 88 + 6x$	B1 B1	F.T.their (a)+(c) if at least ax + bx. Clearing their brackets correctly, if at least of the form a(bx+c). B0 if no brackets or if incorrectly expanded.
$14x - 88$	B1	Correctly collecting terms if at least ax+b and cx involved. No penalty for incorrect factorisation. If B3 awarded, then – 1 once only for any inappropriate extra algebra such as 14x = 88 OR x = 88/14.
	6	
16. *(a)* $\frac{140}{250} \times 100$ OR 10% = 25, 50% = 125, 2% = 5, 6% = 15	M1	Accept any valid 'partition' method. Unsupported 0.56 or 56/100 gets M1 A0.
$= 56(\%)$ OR 56 (%)	A1	C.A.O.
(b) $\frac{35}{100} \times 180$ AND £180 + their answer	M1	Complete method. Need to show a correct process for finding 35% AND adding it to £180.
(£) 63	B1	For sight of (£)63
(£) 243	A1	F.T. their 35% if M1 awarded.
OR		
$\frac{135 \times 80}{100}$	M1	Need to show a correct process for finding 135%
	B1	For sight of the 135 OR 1.35.
(£) 243	A1	
(c) 0042	B2	B1 for ·004(1740595)
	7	
17. *(a)* Area = $\pi \times 9^2$	M1	
$= 254{\cdot}46900$ (cm^2)	A1	Allow 254.3 to 254.6 inclusive OR 254 OR 255
(b) Perimeter = $2 \times \pi \times 9$ OR $\pi \times 18$	M1	
$= 56{\cdot}548667$ (cm)	A1	Allow 56.5 to 56.6 inclusive OR 57 Area in (b) and perimeter in (a) gets 0 marks. HOWEVER SC1 for answers in (a) and (b) which would have gained 4 marks if reversed, e.g. 57 in (a) and 254 in (b).
	4	

2006 Summer Paper 2 (Calculator allowed) Foundation Tier	Marks	FINAL MARK SCHEME Comments
18. $4x - 12 = 20$ OR $x - 3 = 5$ (gets the B2)	B1	Dealing with the bracket correctly Implicit solutions such as $4(8 - 3) = 20$ get full marks.
$4x = 32$	B1	Collecting terms
$x = 32/4$ ISW x = 8 (8)	B1	Answers only get full marks. Final B is B0 if the answer is left as 32÷4. **Stop at the second error.**
	3	
19. *(a)* $3x + x + 40 + 100 + 2x - 56 = 360$ OR $6x + 84 = 360$ OR $6x = 276$ **but not** $x = 46$	B2	B1 For adding the 4 angles OR for expression in x = 360
(b) $6x = 276$	B1	F.T. if equation = 360 OR = 180 Correctly collecting terms if at least ax+b+cx+d involved
$x = 46$	B1	FT if there is a division by a number other than 1.
	4	
20. *(a)* Trapezium = ½(34·6 + 28) × 24 = 751·2 (cm^2)	M1 A1	C.A.O. Allow 751.2^2.
	2	