SCOTTISH QUALIFICATIONS AUTHORITY

2005 Mathematics

Standard Grade – General Paper 1 and Paper 2

Finalised Marking Instructions

These Marking Instructions have been prepared by Examination Teams for use by SQA Appointed Markers when marking External Course Assessments.

Special Instructions

1 The main principle in marking scripts is to give credit for the skills which have been demonstrated. Failure to have the correct method may not preclude a pupil gaining credit for the calculations involved or for the communication of the answer.

Care should be taken to ensure that the mark for any question or part question is entered in the correct column, as indicated by the horizontal line.

Where a candidate has scored zero marks for any question attempted, "0" should be shown against the answer in the appropriate column.

It is of great importance that the utmost care should be exercised in adding up the marks. Where appropriate, all summations for totals and grand totals must be carefully checked.

2 The answer to one part, correct **or incorrect** must be accepted as a basis for subsequent dependent parts of a question. Full marks in the dependent part is possible if it is of equivalent difficulty.

3 Do not penalise insignificant errors. An insignificant error is one which is significantly below the level of attainment being assessed.

eg An error in the calculation of 16 + 15 would not be penalised at Credit Level.

4 Working after a correct answer should **only** be taken into account if it provides **firm** evidence that the requirements of the question have not been met.

5 In certain cases an error will ease subsequent working. **Full** credit cannot be given for this subsequent work but **partial** credit may be given.

6 Accept answers arrived at by inspection or mentally, where it is possible for the answer to have been so obtained.

7 Do not penalise omission or misuse of units unless marks have been specifically allocated to units.

8 A wrong answer without working receives no credit unless specifically mentioned in the marking scheme.

The rubric on the outside of the Papers emphasises that working must be shown. In general markers will only be able to give credit to partial answers if working is shown. However there may be a few questions where partially correct answers unsupported by working can still be given some credit. **Any such instances will be stated in the marking scheme.**

9 Acceptable alternative methods of solution can only be given the marks specified, ie a more sophisticated method cannot be given more marks.

Note that for some questions a method will be specified.

10 In general do not penalise the same error twice in the one question.

11 Accept legitimate variations in numerical/algebraic questions.

12 Do not penalise bad form eg $\sin x^0 = 0{\cdot}5 = 30^0$.

13 A transcription error is not normally penalised except where the question has been simplified as a result.

Mathematics Standard Grade - General Level 2005 – Paper 1

Marking Instructions

Award marks in whole numbers only

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark •
1 (a)	**Ans: 33·82**	
	•[1] correctly subtract 175·48 from 209·3	•[1] 33·82 1K
(b)	**Ans: 5103**	
	•[1] correctly multiply 56·7 by 90	•[1] 5103 1K
(c)	**Ans: 46·3**	
	•[1] correctly divide 324·1 by 7	•[1] 46·3 1K
(d)	**Ans: 42 (cm)**	
	•[1] divide 56 by 4	•[1] 14
	•[2] correctly multiply answer to above by 3	•[2] 42 (cm) 2K

Notes:

In part (d)

(i) For correct final answer without working – award 2/2

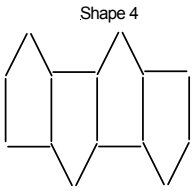
(ii) Acceptable strategies include (56 ÷ 2) + (56 ÷ 4)

(iii) For 56 ÷ 3 × 4 leading to 74⅔ or 74.6… – award 1/2

2	**Ans: 62(°C)**	
	•[1] subtract -50 from 12 or equivalent	•[1] 12 – (-50) or 12 + 50
	•[2] correct difference calculation (see notes below)	•[2] 62(°C) 2K

Notes:

Solutions	With working	Without working
12 – (-50) = 62	2/2	2/2
12 + 50 = 62	2/2	2/2
-50 – 12 = -62	1/2	0/2
12 + (-50) = -38	1/2	0/2
12 – 50 = -38	1/2	0/2
50 – 12 = 38	0/2	0/2

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark •
3 (a)	**Ans:** 	
	•[1] shape 4 correctly drawn	•[1] 1R
(b)	**Ans:**	
	Shape number(s): 3, 4, 6, 13 Number of matches (m): 13, 17, 25, 53	
	•[1] no of matches for shapes 3, 4 and 6	•[1] 13, 17, 25
	•[2] no of matches for shape 13	•[2] 53 2R
(c)	**Ans: $m = 4s + 1$**	
	•[1 2] correct formula	•[1 2] $m = 4s + 1$ 2R
(d)	**Ans: 15**	
	•[1] form correct equation	•[1] $4s + 1 = 61$
	•[2] equation solved correctly	•[2] $s = 15$ 2R

Notes:

In part (c)

(i) For an answer of (=) $4s + 1$ – award 1/2

(ii) Do not penalise bad form

(iii) A formula in words is not acceptable

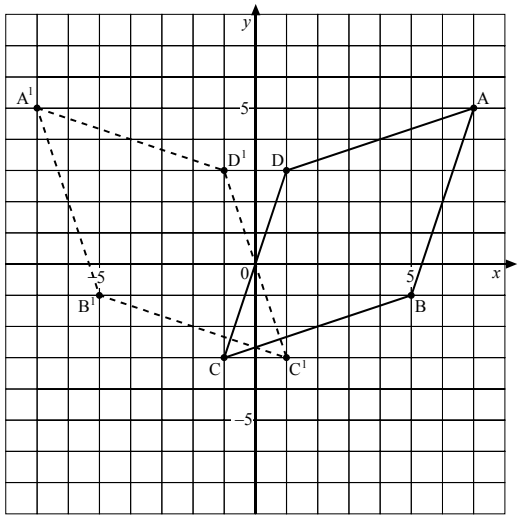
(iv) For $s = 4m + 1$ – award 0/2

In part (d)

(i) Solution may be obtained by extending table

(ii) Final answer of 15 without working – award 0/2

(iii) For $61 \div 4 = 15(\cdot 25)$ – award 1/2

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark •
4 (a)	**Ans: (£)56 000 000** •[1] 2 800 × 20 000 correctly multiplied	•[1] (£)56 000 000 1K
(b)	**Ans: (£)5·6 × 10^7** •[1] Answer to (a) expressed correctly in scientific notation	•[1] (£)5·6 × 10^7 1K
Notes: In part (a) accept an answer of 56 Million or Fifty Six Million		
5 (a)	**Ans:**  •[1] correctly plot 2 points •[2] correctly plot third point	•[1] 2 of the 3 points correct •[2] 3rd point also correct 2K
(b)	•[1] correctly plot 4th point	•[1] (1, 3) plotted 1K
(c)	•[1] know how to reflect in the y-axis •[2] correctly complete reflected diagram	•[1] 2 of points from (a) / (b) correctly reflected •[2] further 2 points reflected correctly 2R
Notes: In part (c) for a correct reflection in a line other than the y-axis – award 1/2		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark •
6	**Ans: 2·04 (kg/sq. cm)** •[1] correct strategy •[2] all calculations correct	•[1] ½(1·97 + 2·11) or equivalent •[1] 2·04 (kg/sq.cm) 2K
Notes: (i) Alternative strategy 1·97 + ½(2·11 – 1·97) (ii) Correct answer with/without working – award 2/2		
7 (a)	**Ans: 39 (p)** •[1] correctly subtract 1·38 from 1·77	•[1] 39 1R
(b)	**Ans: (£) 4.53** •[1] correct strategy leading to 99p •[2] know how to find cost of 4 bottles and 3 rolls •[3] all calculations correct	•[1] 99p •[2] cost = (3 × 99) + (4 × 39) •[3] (£) 4.53 3R
Notes: In part (b) (i) Alternative strategy may be built from the information in (a) eg 2 bottles of water + 1 cheese roll = 1.77 1 bottle of water + 1 cheese roll = 1.38 1 bottle of water + 1 cheese roll = 1.38 (£)4.53 (ii) Calculation must involve a quantity of water and rolls.		

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark •
8	**Ans: 25%** •[1] correctly calculates profit •[2] knows how to find % profit •[3] correctly calculates % profit	•[1] 40p •[2] $40 \div 160 \times 100$ •[3] 25% 3K
Notes: (i) For a correct final answer without working – award 2/3 (ii) For a final answer of 20% with working – award 2/3; without working – award 1/3		
9	**Ans: 105°** •[1] know how to find ∠RPS •[2] know how to find ∠TSP •[3] know how to find ∠SUP	•[1] 45° •[2] 90° – 60° = 30° •[3] 180° – (45° + 30°) = 105° 3R
Notes: (i) Alternative strategy •[1] know how to find ∠SRP •[1] 45° •[2] know how to find ∠TSR •[2] 60° •[3] know how to find ∠SUP •[3] 105° [from ∠SUR = 75°, ∠SUP = 180° – 75° = 105°] (ii) Angles correctly marked on diagram may be accepted (iii) For a correct final answer without working – award 2/3		

KU 17 marks
RE 16 marks

[END OF PAPER 1 MARKING INSTRUCTIONS]

Mathematics Standard Grade - General Level 2005 – Paper 2

Marking Instructions

Award marks in whole numbers only

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark •
1 (a)	**Ans: 7h 30 mins** •[1] know to find time difference •[2] calculation correct	39 min 6h 51 min •[1] 2321 2400 0651 •[2] 7h 30 mins 2K
(b)	**Ans: 85·9 (km/h)** •[1] correct use of formula leading to answer in km/h •[2] correct valid calculation(s) •[3] round to 1 decimal place	•[1] speed = 644 ÷ 7·5 •[2] 85·87 •[3] 85·9 (km/h) (to 1 d.p.) 3K

Notes:

In part (a)

Final answers	With working	Without working
7h 30 min	2/2	2/2
16h 30 min (2320 – 0650)	1/2	0/2

In part (b)

Final answers		With working	Without working
85·9	(644 ÷ 7·5)	3/3	2/3
85·9	(644 ÷ 450 × 60)	3/3	2/3
1·4	(644 ÷ 450)	2/3	0/3
88·2	(644 ÷ 7·3)	2/3	0/3
23·9 m/s	(644000 ÷ 27000)	2/3	0/3

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark •
2 (a)	**Ans:** **1 | 1 7** **2 | 0 5 5 5 5 6 6 8 9** **3 | 1 2 2 2 3 5** **4 | 1 2 3** **(n = 20 4 | 1 = 41)** •[1] stem correct •[2] all leaves listed •[3] order correct	•[1] 1 | 2 3 4 •[2] 7 1 5 5 9 6 0 5 5 8 6 or equivalent 1 2 2 3 5 2 3 2 1 •[3] 1 7 0 5 5 5 5 6 6 8 9 1 2 2 2 3 5 1 2 3 3K
(b)	**Ans: 25** •[1] find mode	•[1] 25 1K

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark •
3 (a)	**Ans: (£)556**	
	•[1] find ⅓ of £834	•[1] 834 ÷ 3 = (£)278
	•[2] subtract answer to above from £834 or equivalent	•[2] 834 – 278 = (£)556
		2K
(b)	**Ans: Big Computer Shop**	
	•[1] calculate cost of instalments	•[1] 24 × 23·33 = 559·92
	•[2] add deposit to above	•[2] (£) 614·92
	•[3] valid comparison	•[3] Big Computer Shop
		3R

Notes:

In part (a)

Final answers	With/without working
556	2/2
556·28 (using 0·333…)	2/2
558·78 (using 0·33)	1/2
583·8 (using 0·3)	1/2

In part (b) for Big Computer Shop without working – award 0/3

4	**Ans: 8·6 (m)**	
	•[1] for knowing to find the length of the short side of right angled Δ	•[1] 13 – 8 = 5
	•[2] for substituting correctly into Pythagoras' Theorem	•[2] $AB^2 = 5^2 + 7^2 = 74$
	•[3] for knowing to find the square root of above	•[3] $AB = \sqrt{74}$
	•[4] all calculations correct within a valid strategy	•[4] AB = 8·6 (m)
		4R

Notes:

(i) For correct final answer without working – award 3/4.

(ii) For a final answer of 5 without working – award 0/4.

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark •
5 (a)	**Ans: $6x - 10$**	
	•[1] correct removal of brackets	•[1] $6x - 15$
	•[2] terms collected	•[2] $6x - 10$ 2K
(b)	**Ans: $x \geq 6$**	
	•[1] inequality rearranged	•[1] $3x \geq 18$
	•[2] solution of inequality	•[2] $x \geq 6$ 2K

Notes:

(i)

	Final answer	With working	Without working
(a)	$6x - 10$	2/2	1/2
	$16x - 40$	1/2	0/2
(b)	$x \geq 6$	2/2	1/2

(ii) In part (b), for an answer of 6, ≥ 6 or $x = 6$ the final mark cannot be awarded.

(iii) In part (b), for $3x = 18$ leading to $x = 6$ – award 1/2.

6	**Ans: (£)150 000**	
	•[1] knowing to find total of points	•[1] 18 pts
	•[2] knowing to divide 900 000 by 18	•[2] (£)50 000
	•[3] knowing to multiply by 3	•[3] 3 × (£)50 000
	•[4] all relevant calculations correct	•[4] (£)150 000 4R

Notes:

(i) Alternative strategy

•[1]	knowing to find total of points	•[1] 18 pts
•[2]	knowing United's share is 1/6	•[2] 1/6
•[3]	knowing to find 1/6 of 900 000	•[3] 1/6 × 900 000
•[4]	all relevant calculations correct	•[4] (£)150 000

(ii) For correct final answer without working – award 2/4.

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark •
7 (a)	**Ans: 403** •[1] subtract 6487 from 6890	•[1] 403 1K
(b)	**Ans: 41.70** •[1] cost of units given in £ •[2] correct VAT calculation •[3] correct addition of Total Charge	•[1] 30.50 •[2] 1.99 •[3] 41.70 3K
Notes: In part (b) ignore variations in rounding		
8	**Ans: (£)5 000 000** •[1] knowing to divide by 15 •[2] knowing to multiply by 100 or equivalent •[3] all calculations correct	•[1] 750 000 ÷ 15 •[2] 50 000 × 100 •[3] (£) 5 000 000 3R

Notes:

(i) Alternative Strategies

15% = 750 000

•[1] 45% = 3 × 750 000 = 2 250 000

•[2] 75% = 2 250 000 + 2(750 000) = 3 750 000

•[3] 100% = 3 750 000 + 1 250 000 = (£) 5 000 000

	Winter Sun	15%	= 750 000
	Flights	15%	= 750 000
•[1]	Summer Tours	45% = 750 000 × 3	= 2 250 000
•[2]	Skiing	25% = 750 000 ÷ 3 × 5	= 1 250 000
•[3]	Total		(£) 5 000 000

(ii) The minimum requirement for the 3rd mark is 750 000 + 750 000 + the income from two other sectors.

(iii) For correct final answer without working – award 2/3.

(iv) The first mark cannot be awarded if solution is based on 15% of 750 000.

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark •
9	**Ans: Once** **1st fill 780 km, 2nd fill 500 km**	
	•[1] know to find distance per tank	•[1] $60 \times 13 = 780$
	•[2] know to divide 1280 by previous answer	•[2] $1280 \div 780 = 1{\cdot}64$ or $1280 - 780 = 500$ or $780 + 780 = 1560$
	•[3] correct response, with reason	•[3] Once, 1st fill 780 km, 2nd fill 500 km or equivalent 3R

Notes:

(i) Alternative strategy

•[1] $1280 \div 13 = 98{\cdot}5$

•[2] $98{\cdot}5 \div 60 = 1{\cdot}64$ or $98{\cdot}5 - 60 = 38{\cdot}5$ or $60 + 60 = 120$

(ii) For a final answer of $1{\cdot}6(4)$ without working – award 1/3.

(iii) Reason must include a comparison.

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark •
10 (a)	**Ans: 3·375 (cm^3)** •[1] calculate volume	•[1] $1{\cdot}5^3 = 3{\cdot}375$ 1K
(b)	**Ans: 48** •[1] know to find no. of cubes in a layer •[2] know to find no. of layers •[3] calculate no. of cubes	•[1] 4×2 •[2] 6 •[3] $4 \times 2 \times 6 = 48$ 3R

Notes:

In part (a) for a final answer of 3·3 or 3·37 without working – award 0/1.

In part (b)

(i) <u>Alternative strategy</u>

•[1]	know to find volume of box	•[1] $9 \times 6 \times 3 = 162$
•[2]	know to divide answer above by 3·375	•[2] $162 \div 3{\cdot}375$
•[3]	all calculations correct	•[3] 48

(ii) For a final answer of 48 without working – award 2/3.

Question No	Give 1 mark for each •	Illustrations of evidence for awarding each mark •
11	**Ans: 21·3°** •[1] valid trig ratio •[2] correct tan value or $\tan^{-1}$ statement •[3] find angle	•[1] tan ABC = 35/90 •[2] tan ABC = 0·389 or ∠ABC = $\tan^{-1}$ (35/90) •[3] ∠ABC = 21.3° 3K

Notes:

(i)

Final answers	With working	Without working
21·3	3/3	2/3
0·371 [RAD]	3/3	2/3
23·6 [GRAD]	3/3	2/3

(ii) Credit should be given where a more laborious method is used.

12	**Ans: 85·12 (cm)** •[1] for substituting correctly into C = πD •[2] correct calculation involving π •[3] correct strategy for total length •[4] calculation of length	•[1] C = πD = 3·14 × 8 •[2] 25·12 (cm) •[3] L = 25·12 + 2 × 30 •[4] 85·12 (cm) 4R

Notes:

Final answers	With working	Without working
85·12 (25·12 (πd) + 60)	4/4	2/4
55·12 (25·12 (πd) + 30)	3/4	0/4
80·24 (50·24 (2πd) + 30)	3/4	0/4
110·24 (50·24 (πr^2) + 60)	3/4	0/4
80·24 (50·24 (πr^2) + 30)	2/4	0/4

KU 23 marks
RE 24 marks

[END OF PAPER 2 MARKING INSTRUCTIONS]

FINAL TOTALS	**KU 40** **RE 40**