2013 Mathematics

Standard Grade – Foundation

Finalised Marking Instructions

Part One: General Marking Principles for Mathematics Standard Grade – Foundation

This information is provided to help you understand the general principles you must apply when marking candidate responses to questions in this Paper. These principles must be read in conjunction with the specific Marking Instructions for each question.

(a) Marks for each candidate response must always be assigned in line with these general marking principles and the specific Marking Instructions for the relevant question. If a specific candidate response does not seem to be covered by either the principles or detailed Marking Instructions, and you are uncertain how to assess it, you must seek guidance from your Team Leader. For technical assistance, e-mail or phone the e-marker helpline.

(b) Marking should always be positive ie, marks should be awarded for what is correct and not deducted for errors or omissions.

GENERAL MARKING ADVICE: Mathematics Standard Grade – Foundation

The marking schemes are written to assist in determining the "minimal acceptable answer" rather than listing every possible correct and incorrect answer. The following notes are offered to support Markers in making judgements on candidates' evidence.

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.

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 are possible if it is of equivalent difficulty.

When marking by question as opposed to by candidate, refer to previous parts of question.

3 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.

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

5 At Foundation level, award full marks for a correct answer without working.

6 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.**

7 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.

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

9 Accept legitimate variations in numerical/algebraic questions.

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

11 A transcription error, where a number has been erroneously transcribed from the examination question, is not normally penalised except where the question has been simplified as a result.

12 When multiple solutions are presented by the candidate and it is not clear which is intended to be the final one, mark all attempts and award the lowest mark.

13 Crossed-out work must be marked if the candidate has not made a second attempt to answer the question. Where a second attempt has been made, the crossed-out answer should be ignored.

Part Two: Mathematics Standard Grade – Foundation

Paper 1

Award marks in whole numbers only

<table>
<tr><th colspan="3">Question</th><th>Marking Scheme
Give 1 mark for each •</th><th>Max Mark</th><th>Illustrations of evidence for awarding a mark at each •</th></tr>
<tr><td>1</td><td>a</td><td></td><td>Ans: 6552

•[1] add 6427 and 125</td><td>1

(KU)</td><td>

•[1] 6552</td></tr>
<tr><td>1</td><td>b</td><td></td><td>Ans: 141·6

•[1] multiply 47·2 by 3</td><td>1

(KU)</td><td>

•[1] 141·6</td></tr>
<tr><td>1</td><td>c</td><td></td><td>Ans: £100

•[1] know how to find 20% of £500

•[2] carry out calculation correctly</td><td>2

(KU)</td><td>

•[1] 500 ÷ 5

•[2] £100</td></tr>
<tr><td colspan="6">Notes:

1. Final Answers with working without working

£100 2/2 2/2
£250 (50%) 1/2 0/2
£166(·6…) (33⅓%) 1/2 0/2
£125 (25%) 1/2 0/2
£50 (10%) 1/2 0/2</td></tr>
<tr><td>2</td><td></td><td></td><td>Ans: 180

•[1] know how to find ¼ of 720

•[2] find ¼ of 720</td><td>2

(KU)</td><td>

•[1] 720 ÷ 4

•[2] 180</td></tr>
<tr><td>3</td><td></td><td></td><td>Ans:

<table><tr><th>Session 1</th><th>Session 2</th><th>Session 3</th></tr><tr><td>Yoga</td><td>Facial</td><td>Manicure</td></tr><tr><td>Yoga</td><td>Sauna</td><td>Manicure</td></tr><tr><td>Yoga</td><td>Sauna</td><td>Pedicure</td></tr><tr><td>Aromatherapy</td><td>Sauna</td><td>Manicure</td></tr><tr><td>Aromatherapy</td><td>Sauna</td><td>Pedicure</td></tr><tr><td>Aromatherapy</td><td>Facial</td><td>Manicure</td></tr><tr><td>Aromatherapy</td><td>Facial</td><td>Pedicure</td></tr></table>
•[1] find some possibilities

•[2] find more possibilities

•[3] find another possibility</td><td>3

(RE)</td><td>

•[1] two correct rows

•[2] a further two correct rows

•[3] a fifth correct row</td></tr>
</table>

Question	Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
4	**Ans: 140°**	**2**	
	•[1] know how to find shaded angle		•[1] 180 − 40
	•[2] subtract correctly	**(KU)**	•[2] 140

Notes:

1. SOME COMMON ANSWERS (with or without working)

320	(360 – 40)	award 1/2
50	(90 – 40)	award 1/2

Question	Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
5	**Ans: £35**	**3**	
	•[1] start to find cost		•[1] (10 × 3) or (2 × 2·50)
	•[2] know how to find cost		•[2] (10 × 3) + (2 × 2·50)
	•[3] carry out calculations correctly	**(KU)**	•[3] 35

Notes:

1. SOME COMMON ANSWERS (with or without working)

32·50	(10 × 3 + 2·50)	award 2/3
30	(10 × 3)	award 1/3
5	(2 × 2·50)	award 1/3

Question	Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
6	**Ans: 25 centimetres**	**3**	
	•[1] know how to find diameter		•[1] 190 − 140
	•[2] know radius is half of diameter		•[2] (190 − 140) ÷ 2
	•[3] carry out calculations correctly (must include a division by 2 and a subtraction)	**(RE)**	•[3] 25

Notes:

1. SOME COMMON ANSWERS (with or without working)

50	(190 – 140)	award 1/3
95	(190 ÷ 2)	award 1/3
70	(140 ÷ 2)	award 1/3

2. Where r is replaced by 25 in πr^2 — award 3/3
   Where d is replaced by 50 in πd — award 1/3
   [Ignore any subsequent working]

Question			Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
7	**a**		**Ans: 100 metres** •[1] know how to find perimeter •[2] add correctly (at least 5 measurements)	**2** **(KU)**	•[1] 30 + 10 + 18 + 10 + 12 + 20 •[2] 100
7	**b**		**Ans: 50 minutes** •[1] start to find time •[2] know how to find time •[3] carry out calculations correctly	**3** **(RE)**	•[1] 100 ÷ 20 or equivalent (See Note 1) •[2] 100 ÷ 20 × 10 or equivalent (See Note 2) •[3] 50 minutes

Notes:

1. The first mark may be awarded for any valid start to finding the time, eg
   2 m → 1 min, 1 m → 0·5 min, 30 m → 15 min, 40 m → 20 min, etc

2. The second mark may be awarded for any valid continuation, eg
   100 ÷ 2, 100 × 0·5, 2 × 15 + 2 × 10, 2 × 20 + 10, etc

3. Where a candidate considers only 80 metres still to be clipped, leading to an answer of 40 minutes, with working — award 2/3

4. Where a candidate confuses metres and minutes, ie 10 (m) – 20 (min) leading to an answer of 200 (min), with working — award 2/3

8			**Ans: 123454321** •[1] state correct value	**1** **(RE)**	•[1] 123454321
9	**a**		**Ans: −3** •[1] find correct level	**1** **(RE)**	•[1] −3
9	**b**		**Ans: −1** •[1] know how to find level •[2] find correct level	**2** **(RE)**	•[1] −2 + 6 − 5 •[2] −1

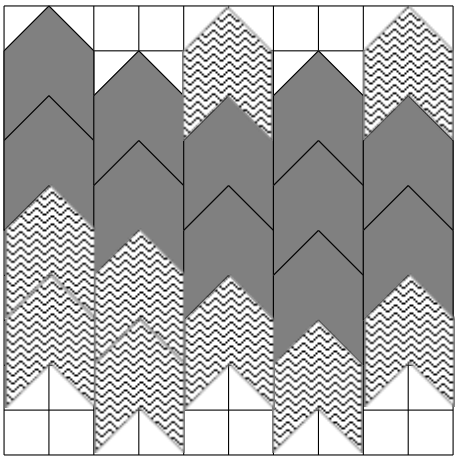
KU 13
RE 13

[END OF PAPER 1 MARKING INSTRUCTIONS]

Paper 2

Award marks in whole numbers only

Question			Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
1			**Ans: 3600 square centimetres** •[1] know how to find area of flag •[2] carry out area calculation correctly	**2** **(KU)**	•[1] 80 × 45 •[2] 3600
Notes: 1. For working subsequent to a correct answer, eg correct answer ÷ 2, with working award 1/2					
2	**a**		**Ans: 9 (± 0·2) cm** •[1] correctly measure distance	**1** **(KU)**	•[1] 9 (± 0·2)
2	**b**		**Ans: 450 (± 10) cm** •[1] know to multiply (a) by 50 •[2] multiply correctly	**2** **(KU)**	•[1] 9 (± 0·2) × 50 •[2] 450 (± 10)
Notes: 1. For an answer of 450 cm in (a) and any or no response in (b), award 0/1 for (a) and 2/2 for (b)					

Question	Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
3	**Ans:**  •[1] interpret diagram and continue pattern •[2] continue pattern •[3] continue pattern	**3** **(RE)**	PLEASE NOTE: The extra diagrams can be accessed from the thumbnails on the left. •[1] one tile added •[2] second tile added •[3] third tile added

Notes:

1. Do not penalise candidates for additional incorrect tiles
2. Correct tiles may appear in different diagrams
3. Accept continuation of tiling outwith the grid
4. Where a candidate uses a different tile and follows this through award 0/3

Question	Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
4	**Ans: 15th, 16th, 17th**	**3**	
	•[1] choose 3 dates which satisfy one worker		•[1] evidence (see notes)
	•[2] choose 3 dates which satisfy two workers		•[2] evidence (see notes)
	•[3] choose 3 dates which satisfy all three workers		•[3] 15th, 16th, 17th
		(RE)	

Notes:

1. For an answer of 15, 16, 17 — award 3/3 (J and P and E)

2. For the following answers (excluding 15, 16, 17) — award 2/3
   - (a) Any 3 dates from 15 – 20 (J and P)
   - (b) Any 3 dates from 8, 9 ,10, 14, 15, 16, 17 (J and E)
   - (c) Any 3 dates from 15, 16, 17, 21, 22 (E and P)

3. For the following answers (excluding 15, 16, 17 AND answers covered in NOTE 2) — award 1/3
   - (a) Any 3 dates from 8 – 20 (J only)
   - (b) Any 3 dates from 15 – 22 (P only)
   - (c) Any 3 dates from 1 – 3, 7 – 10, 14 – 17, 21 – 24, 28 – 31 eg (8th, 15th, 29th) (E only)

4. Where two dates are given
   for 15, 16 OR 15, 17 OR 16, 17 — award 2/3
   otherwise — award 0/3

5. Where only one date is given
   for 15 OR 16 OR 17 — award 1/3

Question			Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
5	**a**		**Ans: 24 cubic centimetres** •[1] know how to find volume of cuboid •[2] carry out volume calculation correctly	**2** **(KU)**	 •[1] $6 \times 2 \times 2$ •[2] 24
Notes: 1. Where a candidate calculates the total length of the edges, ie $6 \times 4 = 24$ and $8 \times 2 = 16$ leading to 40, award 0/2					
5	**b**		**"The cube has the larger volume since 27 > 24" or "The cube is larger by 3"** •[1] know how to find volume of cube •[2] carry out volume calculation correctly •[3] correct conclusion with reason (reason must contain a numeric comparison or a difference)	**3** **(RE)**	 •[1] $3 \times 3 \times 3$ •[2] 27 •[3] cube, 27 > 24

Question	Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
6	**Ans: £23·30**	**3**	
	•[1] start to find cost		•[1] $(3 \times 5{\cdot}30)$ or $5{\cdot}40$ or $(4 \times 0{\cdot}50)$
	•[2] know how to find cost		•[2] $(3 \times 5{\cdot}30) + 5{\cdot}40 + (4 \times 0{\cdot}50)$
	•[3] carry out calculation correctly (must include a multiplication and an addition)	**(KU)**	•[3] $23{\cdot}30$

Notes:

1. SOME COMMON ANSWERS (with or without working)

$21{\cdot}80$	$(3 \times 5{\cdot}30 + 5{\cdot}40 + 0{\cdot}50)$	award 2/3
$21{\cdot}30$	$(3 \times 5{\cdot}30 + 5{\cdot}40)$	award 2/3
$17{\cdot}90$	$(3 \times 5{\cdot}30 + 4 \times 0{\cdot}50)$	award 2/3
$7{\cdot}40$	$(5{\cdot}40 + 4 \times 0{\cdot}50)$	award 2/3
$15{\cdot}90$	$(3 \times 5{\cdot}30)$	award 1/3
$5{\cdot}40$		award 1/3
$2{\cdot}00$	$(4 \times 0{\cdot}50)$	award 1/3

2. A multiple of 50p appearing in the working, eg £1·50, should be accepted as evidence of a multiplication for the booking fee.

Question			Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
7	**a**		**Ans:** No of posters: 1 2 3 4 5 6 11 No of drawing pins: 4 6 **8** **10** **12** **14** **24**	**4**	
			•[1] interpret diagram and continue pattern •[2] continue pattern •[3] know how to extend pattern •[4] extend pattern	**(RE)**	•[1] 8 •[2] 10, 12, 14 •[3]•[4] 24 (award 1 for evidence of extended pattern but with one error)

Notes:

1. FOLLOW THROUGH ERRORS

   3/4 can be awarded for a "correct" continuation with one error

   eg 4, 6, 9, 11, 13, 15 …25 award 3/4
   4, 6, 9, 12, 15, 18 …33 award 3/4
   4, 6, 7, 9, 11, 13 …23 award 3/4
   4, 6, 9, 13, 18, 24 …69 award 3/4
   4, 6, 10, 16, 24, 34 …114 award 3/4

2. For an answer of 4, 6, 7, 8, 9, 10, …15 award 1/4 (working eased)

Question			Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
7	**b**		**Ans: × 2 + 2** •[1]•[2] generalise pattern	**2** **(RE)**	•[1]•[2] × 2 + 2 (accept + 1 × 2)

Notes:

1. Accept "bad form" eg posters + posters + 2

2. Do not accept "it goes up in twos" or "add on 2 for each poster"

3. Where an error has been made in part (a), 1/2 may be awarded for a rule which is true for **at least three** of the entries made by the candidate, eg

   for 4, 6, 9, 11, 13, 15 …25 in part (a) followed by × 2 + 3 in part (b), award 1/2 in part (b)

4. A mark of 1/2 may **only** be awarded for the situation described in NOTE 3.

Question			Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
8	**a**		**Ans: £30**	**2**	
			•[1] know how to calculate pay		•[1] $4 \times 7{\cdot}50$
			•[2] carry out calculation correctly	**(KU)**	•[2] £30
8	**b**		**Ans: 6 hours**	**3**	
			•[1]•[2] know how to find number of hours		•[1]•[2] $90 \div (2 \times 7{\cdot}50)$ (award 1 for $90 \div 2$ or $90 \div 7{\cdot}50$ or $2 \times 7{\cdot}50$)
			•[3] carry out calculations correctly (must include two divisions or a multiplication and a division)	**(RE)**	•[3] 6

Notes:

1. SOME COMMON ANSWERS (with or without working)

12	$(90 \div 7{\cdot}50)$	award 1/3
45	$(90 \div 2)$	award 1/3
15	$(2 \times 7{\cdot}50$ or $30 \div 2)$	award 1/3

2. For an answer of 4 $[(90 - 30) \div (2 \times 7{\cdot}50)]$ with working — award 2/3

3. For an answer of 8 $[(90 - 30) \div 7{\cdot}50]$ with working — award 0/3

9	**a**		**Ans: 21%**	**3**	
			•[1] begin strategy		•[1] 27 + 17 + 35
			•[2] continue strategy		•[2] 100 – (27 + 17 + 35)
			•[3] carry out calculations correctly	**(KU)**	•[3] 21

Notes:

1. SOME COMMON ANSWERS (with or without working)

281	[360 – (27 + 17 + 35)]	award 2/3
79	27 + 17 + 35	award 1/3

Question			Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
9	**b**		**Ans: £5440**	**3**	
			•[1] interpret pie chart		•[1] 17(%)
			•[2] know how to calculate amount spent on food		•[2] $\frac{17}{100} \times 32000$ or equivalent (must be evidence of × 17 **and** ÷ 100)
			•[3] carry out calculations correctly	**(KU)**	•[3] 5440

Notes:

1. SOME COMMON ANSWERS (with or without working)

54400	(32000 × 17 ÷ 10)	award 2/3
8640	(27% of 32000)	award 2/3
11200	(35% of 32000)	award 2/3
6720	(21% of 32000)	award 2/3
1882(·35...)	(32 000 ÷ 17)	award 1/3

2. For an incorrect attempt to calculate 17% of 32000 where 17 has been split into 10 and 7

eg 32000 ÷ 10 ÷ 7 award 1/3

10			**Ans: 484**	**2**	
			•[1]•[2] interpretation	**(RE)**	•[1]•[2] 484 (award 1 for any other answer which is a **new** palindrome)
11			**Ans: 7 hours 30 minutes**	**3**	
			•[1] identify correct times		•[1] 0830 – 1600
			•[2] evidence of time interval calculation		•[2] 0830 → 1600
			•[3] work out time interval	**(KU)**	•[3] 7 hours 30 minutes

Notes:

1. SOME COMMON ANSWERS (with or without working)

13 h	(0700 → 2000)	award 2/3
8 h 30 m	(0830 → 1700)	award 2/3
10 h	(0700 → 1700)	award 2/3

2. EXAMPLES OF EVIDENCE FOR 2ND MARK

0830 → 1600, 0830 to 1600, 0830⌒1600, 1600 – (0)830

Question			Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
12			**Ans: 6 children** $\bullet^1\bullet^2$ know how to find mean $\bullet^3$ add correctly $\bullet^4$ divide correctly	**4** **(KU)**	$\bullet^1\bullet^2$ $(8 + 7 + 7 + 7 + 4 + 7 + 9 + 4 + 5 + 2 + 5 + 7) \div 12$ $\bullet^3$ 72 $\bullet^4$ 6
Notes: 1. SOME COMMON ANSWERS (with or without working) $65{\cdot}5(8\ \ldots)$ $8 + 7 + 7 + 7 + 4 + 7 + 9 + 4 + 5 + 2 + 5 + 7 \div 12$ (incorrect use of calculator) award 3/4 72 award 1/4 7 (mode or median) award 0/4					
13	**a**		**Ans:** ●●●● + ▁● + ▁●● $\bullet^1$ express sum in Mayan system	**1** **(RE)**	$\bullet^1$ ●●●● + ▁● + ▁●●
13	**b**		**Ans:** ●● ═ $\bullet^1$ add correctly $\bullet^2$ express answer using dots and/or bars $\bullet^3$ express answer in correct form	**3** **(RE)**	$\bullet^1$ 17 (see Note 1) $\bullet^2$ evidence $\bullet^3$ ●● ═
Notes: 1. Evidence of 17 may appear in (a) or be implicit in subsequent working eg for an answer of • ▁●● award 1/3 (✓××)					

Question			Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
14	**a**		**Ans: 0·35 metres** •[1] know that 100 cm = 1 m •[2] convert to metres	**2** **(KU)**	 •[1] 100 •[2] 0·35

Notes:

1. SOME COMMON ANSWERS (with or without working)

   3·5 (1 m = 10 cm) award 1/2
   0·035 (1 m = 1000 cm) award 1/2

Question			Marking Scheme Give 1 mark for each •	Max Mark	Illustrations of evidence for awarding a mark at each •
14	**b**		**Ans: 5 tyres** •[1] know how to work out number of tyres •[2] divide correctly •[3] appropriate rounding and conclusion	**3** **(RE)**	 •[1] 2 ÷ 0·35 or equivalent •[2] 5·7 (1428 …) •[3] 5

Notes:

1. The 1st mark should be awarded for repeated addition of 0·35 or 35 (at least two)
2. Candidates who use the strategy in Note 1 should be awarded the 2nd mark for 1·75 or 175 or 2·1(0) or 210
3. Where the answer to part (a) is greater than 2, eg 3·5, a maximum of 2/3 is available in part (b) as follows:
   2 ÷ 3·5 = 0·57… = 0 ✓✓×

KU 27
RE 27

OVERALL TOTAL MARKS
40 KU 40 RE

[END OF PAPER 2 MARKING INSTRUCTIONS]