Mark Scheme (Results)

Summer 2012

International GCSE Mathematics
(4MA0) Paper 1F

Level 1 / Level 2 Certificate in
Mathematics
(KMA0) Paper 1F

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme.
  Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.
- **Types of mark**
  - M marks: method marks
  - A marks: accuracy marks
  - B marks: unconditional accuracy marks (independent of M marks)
- **Abbreviations**
  - cao – correct answer only
  - ft – follow through
  - isw – ignore subsequent working
  - SC - special case
  - oe – or equivalent (and appropriate)
  - dep – dependent

- o indep – independent
- o eeoo – each error or omission

- **No working**

  If no working is shown then correct answers normally score full marks – the mark scheme will make it clear when this does not apply.

  If no working is shown then incorrect (even though nearly correct) answers score no marks.

- **With working**

  If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

  If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks.

  Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks.

  If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.

  If there is a choice of methods shown, then the lower mark should be awarded, unless it is clear which method the candidate has chosen.

  If there is no answer on the answer line then check the working for an answer.

- **Ignoring subsequent work**

  It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: eg. Incorrect cancelling of a fraction that would otherwise be correct.

  It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect eg algebra.

  Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

- **Parts of questions**

  Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

Question Number		Working	Answer	Mark	Notes	

Apart from Question 12(b) (where the mark scheme states otherwise) the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method.

Question Number		Working	Answer	Mark	Notes	
1.	(a)		9367	1	B1	cao
	(b)		hundreds	1	B1	Also accept hundred, 200, 100
	(c)		8000	1	B1	cao
	(d)		6028	1	B1	cao
	(e)		5217	1	B1	cao
						Total 5 marks

Question Number		Working	Answer	Mark	Notes	
2.	(a)		900	1	B1	cao
	(b)		2nd	1	B1	Accept any clear indication
	(c)		1800< bar ≤1900	1	B1	Accept 1900 but not 1800
	(d)	eg $\frac{7}{100}\times 3440$		2	M1	
			240.8 or 241		A1	Also accept 240
	(e)	$\frac{1639}{3440}\times 100$		2	M1	for $\frac{1639}{3440}$ (0.47645…)
			47.6		A1	for ans rounding to 47.6
						Total 7 marks

Question Number	Working	Answer	Mark	Notes
3. (a)		radius	1	B1
(b)		5.2-5.6	1	B1
(c)(i)		127-131	2	B1
(ii)		obtuse		B1
(d)		correct line	1	B1 Award if intention clear
(e)		isosceles	1	B1
				Total 6 marks
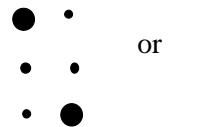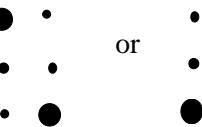
| Question Number	Working	Answer	Mark	Notes
4. (a)		0.45	1	B1 cao
(b)		2.37	1	B1 cao
(c)		thousandths	1	B1 Also accept thousandth, 0.001, $\frac{1}{1000}$, 0.003, $\frac{3}{1000}$
(d)	0.06 0.08 0.1 0.18 0.2		2	B2 B1 for 4 decimals in correct order or for 0.2 0.18 0.1 0.08 0.06
				Total 5 marks

Question Number	Working	Answer	Mark	Notes
5. (a)		0.85	1	B1 cao
(b)	$\dfrac{85}{100}$		2	M1
		$\dfrac{17}{20}$		A1 cao
(c)	−2 − (−9) or −7		2	M1
		7		A1 cao
(d)		17 02	1	B1
(e)	eg 55 min + 9 h + 2 min 9 h + 55 min + 2 min 10 h − 3 min		3	M2 M1 for each of the following up to a maximum of 2 marks 1. 17 02 − 7 05 but not 7 05 − 5 02 2. An attempt to make some use of a counting on method (for example, a list of 3 or more relevant times may be taken as sufficient evidence of this) 3. 9 on the hours answer line 4. 57 on the minutes answer line *SC* If no method marks scored, award B1 for 10 h 3 mins
		9 (hours) 57 (minutes)		A1 cao
(f)		15	1	B1 Also accept 0.15 oe
				Total 10 marks

Question Number	Working	Answer	Mark	Notes
6. (a)		21 18	2	B2 B1 for 21 B1 for 18 Also award B1 for 39 B1 for 42
(b)		eg take away 3	1	B1 See Additional Guidance
(c)		0	1	B1 cao
				Total 4 marks

Question Number		Working	Answer	Mark	Notes
7.	(a)		0	1	B1 Accept none, zero
	(b)(i)		X	2	B1
	(ii)		T		B1
	(c)			1	B1
					Total 4 marks

Question Number		Working	Answer	Mark	Notes
8.	(a)		1020	1	B1 cao
	(b)	$85n = 765$ oe or $765 \div 85$		2	M1
			9		A1 cao
	(c)		$C = 85n$	2	B2 B1 for $C =$ linear expression B1 for $85n$ oe *SC* B1 for $n = \dfrac{C}{85}$ oe
	(d)	$1800 \div 85$ or $21.176\ldots$ or 21		2	M1
			22		A1 cao
					Total 7 marks

Question Number	Working	Answer	Mark	Notes
9. (a)		4	1	B1 cao
(b)		5	2	B2 B1 for 1-6 1 to 6 1,6 etc
(c)	$1\times3 + 2\times6 + 3\times5 + 4\times8 + 5\times2 + 6\times1$ or $3 + 12 + 15 + 32 + 10 + 6$ or 78		3	M1 for finding at least 4 correct products and summing them
	"78" $\div$ 25			M1 (dep) for division by 25 Accept division by their 25, if addition shown.
		3.12 oe inc $3\frac{3}{25}$, $\frac{78}{25}$		A1 Also accept 3 or 3.1 if both method marks scored
(d)(i)		0	5	B1 Also accept $\frac{0}{1}$ or $\frac{0}{25}$
(ii)		$\frac{2}{25}$		M1 denominator of 25 A1 numerator of 2
(iii)	5 + 8 or 13 or $\frac{5}{25} + \frac{8}{25}$			M1
		$\frac{13}{25}$		A1
				Total 11 marks

Question Number	Working	Answer	Mark	Notes
10. (a)	$360 - (119 + 82 + 81)$		2	M1
		78		A1 cao
(b)(i)		81	2	B1 cao
(ii)		alternate		B1 for 'alternate' unless contradicted – accept any recognisable spelling. Accept 'alt' Award B1 for acceptable answer accompanied by 'Z' Do not award B1 for 'Z' alone
				Total 4 marks

Question Number		Working	Answer	Mark	Notes
11.	(a)	320×1.45		2	M1
			464		A1 cao
	(b)	$841 \div 1.45$		2	M1
			580		A1 cao
					Total 4 marks

Question Number		Working	Answer	Mark	Notes
12.	(a)	$2x = 1 - 9$ or $2x = -8$ or $2x + 8 = 0$		2	M1
			−4		A1 Award 2 marks for a correct answer, unless clearly obtained by an incorrect method
	(b)	$6y - 3 = 6$ or $2y - 1 = 2$		3	M1 for correct expansion ($6y - 3$ seen) or correct division of both sides by 3 ($2y - 1 = 2$) May be implied by second M1
		$6y = 6 + 3$ or $6y = 9$ or $6y - 9 = 0$ or $2y = 2 + 1$ or $2y = 3$ or $2y - 3 = 0$			M1 for correct rearrangement Also award for $6y = 6 + 1$ or $6y = 7$ or $6y - 7 = 0$ if preceded by $6y - 1 = 6$
			$1\frac{1}{2}$ oe		A1 Award 3 marks if answer is correct and at least one method mark scored
					Total 5 marks

Question Number		Working	Answer	Mark	Notes
13.	(a)	$54 \times \dfrac{5}{6}$		2	M1 for 54×5 or 270 or $54 \div 6$ or 9 or $\dfrac{5}{6}$ oe or $\dfrac{6}{5}$ oe
			45		A1 cao
	(b)	ratio 36 : 5400 oe inc 0.36 : 54, 36 cm : 5400 cm, 0.36 m : 54 m (condone omission of units from one side) or fraction $\dfrac{5400}{36}$ oe inc $\dfrac{54 \, \text{m}}{0.36 \, \text{m}}$ (condone omission of units from either numerator or denominator)		3	M2 M1 for ratio or fraction with no units 0.36 or 3.6 or 36 or 360 or 3600... : 0.54 or 5.4 or 54 or 540 or 5400 ... oe $\dfrac{0.54 \text{ or } 5.4 \text{ or } 54 \text{ or } 540 \text{ or } 5400...}{0.36 \text{ or } 3.6 \text{ or } 36 \text{ or } 360 \text{ or } 3600...}$ oe eg 36 : 54, $\dfrac{54}{36}$, 36 : 540, $\dfrac{540}{36}$, 360 : 54, $\dfrac{54}{360}$, 1 : 1.5, $54 \div 36$, 1 : 0.15
			150		A1 cao Do not award A1 for 150 cm, 150n etc
					Total 5 marks

Question Number		Working	Answer	Mark	Notes		
14.	(a)	$2 \times (-3)^2 + 4 \times (-3)$ or $2 \times -3^2 + 4 \times -3$ or $2 \times 9 - 4 \times 3$ or $18 - 12$ or $18 + -12$		2	M1	for substitution or for correct evaluation of either 18 or −12	
			6		A1	cao	
	(b)	$38 = 2 \times 4^2 + 4k$ or $(k) = \dfrac{A - 2x^2}{x}$ oe		3	M1	for correct substitution or rearrangement	*SC* M2 for $\dfrac{38 - 32}{4}$
		$4k = 38 - 32$ or $4k = 6$			M1	for correct rearrangement of correct substitution	
			1.5 oe		A1		
							Total 5 marks

15.	(a)		125	1	B1	cao
	(b)	$\dfrac{12}{3} \times 3.5$ or $\dfrac{15}{3} \times 3.5 - 3.5$		2	M1	for $\dfrac{12}{3}$ or 4 or $\dfrac{15}{3}$ or 5
			14		A1	cao
	(c)	scale factor $= \dfrac{15}{3}$ or 5 or $\dfrac{3}{15}$ or $\dfrac{1}{5}$		3	M1	for $\dfrac{15}{3}$ or 5 or $\dfrac{3}{15}$ or $\dfrac{1}{5}$
		$19 \div 5$ or $19 \times \dfrac{1}{5}$			M1	Also award for $19 \div 4$ or $19 \times \dfrac{1}{4}$ May be implied by 4.75
			3.8		A1	cao
						Total 6 marks

Question Number	Working	Answer	Mark	Notes	
16. (a)		2^9	1	B1	cao
(b)		3^5	1	B1	cao
(c)	$5^{n-4-6} = 5^3$ oe or $5^{n-10} = 5^3$ oe or $n - 4 - 6 = 3$ oe or $n - 10 = 3$ oe or $5^n = 5^3 \times 5^{10}$ oe or $5^n = 5^{3+10}$ or $5^n = 5^{13}$		2	M1	*SC* If M0, award B1 for an answer of 5^{13}
		13		A1	cao
					Total 4 marks

17.	$5.6^2 + 3.7^2$ or $31.36 + 13.69$ or 45.05		3	M1	for squaring and adding
	$\sqrt{5.6^2 + 3.7^2}$			M1	(dep) for square root
		6.71		A1	for answer rounding to 6.71
					Total 3 marks

18.		1 3 8	2	B2	for 1 3 8 in any order B1 for three positive whole numbers with either a sum of 12 or a range of 7 *SC* Award B1 for 0 5 7
					Total 2 marks

Question Number	Working	Answer	Mark	Notes	
19.	Lines $x = 5$ and $y = 3$ drawn		3	B1	Lines may be full or broken
	Line $y = x$ drawn			B1	Ignore additional lines
		R shown		B1	Condone omission of label Accept shading in or shading out, if consistent Award full marks for correct region labelled **R** even if no shading
.					**Total 3 marks**

Q6(b) – Additional Guidance

3 may be explicitly stated

      eg Accept   *Subtract 3*
                          Take away 3
                          -3
                          goes down in threes
                          3 less
                          $n-3$
                          $39-3n$

      but do not accept just '3'

3 may be implied

      eg Accept   *Count from 36 to 33* ['down' implied]
                          I counted the difference between 36 and 33
                          I found the difference
                          [Condone imprecise use of 'difference'.]

the fact that the terms are multiples of 3 may be stated or implied

      eg Accept   *Multiples of 3*
                          3 times table

as 39, 42 are now acceptable answers to part (a), we must extend the range of answers to part (b)

      eg Accept   *I counted up in 3s*
                          Add 3
                        goes up in 3s

Do not accept a non-specific description

      eg *I looked at the numbers and found a pattern.*

Ofqual

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