Mark Scheme (Results)

January 2018

Pearson Edexcel International GCSE Mathematics A (4MA0) Foundation Paper 2FR

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January 2018
Publications Code 4MA0_2FR_1801_MS

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

- **No working**
  If no working is shown then correct answers normally score full marks
  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  If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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 no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.
  If there is no answer on the answer line then check the working for an obvious 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		Working	Answer	Mark	Notes	
1	(a)		32	1	B1	
	(b)		28	1	B1	
	(c)	18 + 12 or 30	$3\frac{3}{4}$ rugby balls	2	M1 A1	For 18 + 12 or 30
2	(a)		79 or 83	1	B1	
	(b)				M1	M1 for 8, 16.... or 12,24....
			24 or 48	2	A1	For 24 or 48 SCB1 for 16, 32, 36, 40
	(c)(i)		2 or 18 or 22	1	B1	
	(ii)		9	1	B1	
	(iii)		27	1	B1	
3	(a)(i)		Isosceles	1	B1	
	(a)(ii)		Line of symmetry correctly drawn	1	B1	
	(b)		2	1	B1	
	(c)(i)		Octagon	1	B1	
	(ii)	8 × 2	16	2	M1 A1	

Question		Working	Answer	Mark	Notes
4	(a)		39	1	B1
	(b)		− 17	1	B1
	(c)		22	1	B1
	(d)		$4x + 15$	1	B1 Oe Eg $x \times 4 + 15$
	(e)		$\frac{y-15}{4}$ oe	2	M1 For a correct inverse operation A1
5	(a)		(5, 6)	1	B1
	(b)		× at (5, 0)	1	B1
	(c)	$\left(\frac{1+5}{2}, \frac{2+6}{2}\right)$	(3, 4)	2	M1 For correct x-coordinate or correct y-coordinate A1 SCB1 for (4, 3)
6	(a)		$\frac{5}{12}$	1	B1
	(b)		0.8	1	B1
	(c)		Any fraction equivalent to $\frac{6}{18}$	1	B1
	(d)		29	1	B1
	(e)		4.5	1	B1

Question		Working	Answer	Mark	Notes	
7	(a)(i)		metres	1	B1	Accept m
	(ii)		grams	1	B1	Accept g
	(b)(i)		15 12	1	B1	
	(ii)	Eg 3 12 to 5 12 to 6 00 + (55 – 48) or 3 12 + 2 55 or 5 67	6 07 (pm)	2	M1 A1	For a complete method Accept 18 07
8	(a)		0.09, 0.16, 0.203, 0.28, 0.51	1	B1	
	(b)		7	1	B1	
	(c)		10.3	1	B1	
	(d)		420	1	B1	
9	(a)		$4e$	1	B1	
	(b)		$4pq$	1	B1	
	(c)		$8x + 3y$	2	B2	B1 $8x$ or $3y$
	(d)		$a(4b + 7a - 1)$	2	B2	B1 for factors which, when expanded and simplified, give three terms, at least one of which is correct.

Question		Working	Answer	Mark	Notes	
10	(a)		9.4	1	B1	Accept $\frac{47}{5}$
	(b)		21	1	B1	
	(c)(i)		1384.5841	1	B1	Accept 1384(5841) rounded or truncated
	(ii)		1400	1	B1	Ft if (i) at least 3SF
11	(a)(i)		× at 0	1	B1	
	(ii)		× at $\frac{3}{4}$	1	B1	
	(b)		Correct table	2	M1 A1	For 3 correct entries
	(c)		$\frac{6}{16}$ oe	2	M1ft A1ft	For $\frac{6}{a}$ where $6 \leq a \leq 16$ or For $\frac{b}{16}$ where $1 \leq b \leq 16$ where a and b are integers

Question		Working	Answer	Mark	Notes
12	(a)(i)		5.5	1	B1
	(ii)		Correct shape	1	B1
	(b)		Correct reflection	2	M1 4 or 5 correct lines A1 SCB1 for correct shape and orientation in wrong position
	(c)		Translation 4 to the right and 1 down	2	B2 For translation and 4 to the right and 1 down B1 for translation or 4 to the right and 1 down Accept $\begin{pmatrix} 4 \\ -1 \end{pmatrix}$ NB: No marks for multiple transformations
13	(a)	$190 \div 12$ or 15.8(333....)	15	2	M1 For 15×12 (=180) or 16×12 (=192) A1
	(b)	$190-15\times12$ or $190-180$ or $0.8(333\ldots) \times 12$	10	2	M1ft Provided answer in (a) is an integer less than 15 A1

Question	Working	Answer	Mark	Notes
14	$\frac{400}{5+3}$ or 50 or $\frac{400}{5+3} \times 5$ (=250) or $\frac{400}{5+3} \times 3$ (=150) "50" × 2	100	3	M1 M1 For $\frac{400}{5+3} \times 5 (= 250)$ **and** A1 $\frac{400}{5+3} \times 3 (= 150)$
	Alternative Method			
		100	3	M2 A1 For $\frac{2}{8} \times 400$
15 (a)	$36 \times \frac{12}{100}$ oe (= 4.32) 36 – "4.32"	31.68	3	M1 M1 M2 for a complete method Eg 0.88 × 36 oe A1
(b)	$\frac{81}{180} \times 100$ (%)	45	2	M1 A1 For $\frac{81}{180}$ oe

Question		Working	Answer	Mark	Notes	
16	(a)		3	1	B1	
	(b)	$0 \times 1, 1 \times 8, 2 \times 12, 3 \times 15, 4 \times 4$ or $0, 8, 24, 45, 16$	93	2	M1	For at least 4 products (may not be evaluated.
					A1	SCB1 for 94
	(c)	$\frac{15}{40} + \frac{4}{40}$ oe	$\frac{19}{40}$	2	M1	
					A1	oe Eg 0.475 SCB1 for $\frac{31}{40}$ or 0.775
17		Eg $\sin 20 = \frac{BC}{8.4}$ or $\frac{BC}{\sin 20} = \frac{8.4}{\sin 90}$ or $\frac{\sin 20}{BC} = \frac{\sin 90}{8.4}$	2.87	3	M1	Or for AC or angle B evaluated correctly **AND** then used in a correct method to find BC Eg $BC^2 + (7.89(34...))^2 = 8.4^2$ or Eg $\tan 20 = \frac{BC}{7.89(34...)}$
		$8.4\sin 20$ or $\frac{8.4}{\sin 90} \times \sin 20$ or $8.4\cos 70$			M1	
					A1	For a complete method Accept 2.87(296...) rounded or truncated to at least 3 SF
18	(a)	Eg 3×6 or 18 or 3×4 or 12 or 8×2 or 16 or 5×2 or 10 or 8×6 or 48 or 4×5 or 20	28	3	M1	For method to find the area of a rectangle
		Eg $3 \times 6 + 5 \times 2$ or $3 \times 4 + 8 \times 2$ or $8 \times 6 - 4 \times 5$			M1	Complete method
					A1	
	(b)	$\frac{350}{"28"}$ or $"28" \times h = 350$	12.5	2	M1ft	
					A1ft	

Question		Working	Answer	Mark	Notes	
19	(a)	$4 > 11 + 8p$ or $-8p > 11 - 4$ or $-8p > 7$ or $8p < 4 - 11$ or $8p < -7$	$p < \frac{-7}{8}$	2	M1	Accept $4 = 11 + 8p$ or $-8p = 11 - 4$ or $\frac{-7}{8}$ or $8p = 4 - 11$
					A1	Condone $p < -0.875$ Mark the final answer
	(b)	$x^2 + 3x - 6x - 18$	$x^2 - 3x - 18$	2	M1	For 3 correct terms or For 4 correct terms ignoring signs or For $x^2 - 3x + c$ for any non-zero value of c or For ... $- 3x -$ 18
					A1	
	(c)		y^8	1	B1	
	(d)		$9e^2$	2	B2	B1 for 9 or e^2 as part of a product or for $3^2 \times e^2$
	(e)		3	2	M1	For 2^{11-2-3} or 2^6 or 64 or 4^3 or 2^{2n}
					A1	Accept 4^3

Question	Working	Answer	Mark	Notes

20 (i)		1, 2, 23, 31, 46, 62, 713, 1426	3	B3 Accept factor written as products.
				If not B3 then
				B2 for three of 1, 46, 62, 713, 1426
				
				If not B2 then
				B1 for one of 46, 62, 713 or four of 1, 2, 23, 31, 1426

(ii)		23×31	1	B1