Mark Scheme (Results)

January 2020

Pearson Edexcel International GCSE
In Mathematics A (4MA1)
Paper 2FR

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January 2020
Publications Code 4MA1_2FR_2001_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.
- 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

- indep – independent
- awrt – answer which rounds to
- 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.
  If a candidate misreads a number from the question. Eg. Uses 252 instead of 255; method marks may be awarded provided the question has not been simplified. Examiners should send any instance of a suspected misread to review. If there is a choice of methods shown, mark the method that leads to the answer on the answer line; where no answer is given on the answer line, award the lowest mark from the methods shown.
  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 to another.

International GCSE Maths A January 2020 – Paper 2FR Mark scheme

Apart from Questions 12d and 21, 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	Working	Answer	Mark	Notes
1 (a)		70 216	1	B1 cao
(b)		1, 2, 5 or 10	1	B1 Any of these values with no other incorrect value
(c)		25 or 36	1	B1 One or both of 25 or 36 and no other incorrect value
(d)		15	1	B1
(e)		$42 - 6 \div (6 - 3)$	1	B1 Allow $42 - (6 \div (6 - 3))$
				Total 5 marks

2 (a)		Frequencies and tallies of 2, 3, 8, 4, 5, 2	2	B2 All frequencies and tallies correct B1 for 3, 4 or 5 frequencies or tallies correct NB. Frequencies and tallies must be in the correct column. Accept 2/24 etc. in frequency column
(b)		3	1	B1ft Follow through from table
(c)		Sensible statement	1	B1 Not enough 1's or 6's Too many 3's Rolled a 3 a third of the times Should expect to get 4 of each number
				Total 4 marks

3 (a)		An acute angle drawn at *A*	1	B1
(b)		Diameter drawn	1	B1 Diameter should not extend significantly beyond circumference.
				Total 2 marks

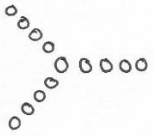
Question		Working	Answer	Mark	Notes
4	(a)		$\frac{11}{15}$	1	B1oe
	(b)		$4\frac{3}{5}$	1	B1oe eg $4\frac{6}{10}$
	(c)		$\frac{23}{100}$	1	B1oe eg $\frac{46}{200}$
	(d)		0.4	1	B1 Accept 0.40
	(e)		3.555, 3.61, 3.7, 3.82, 3.9	1	B1
					Total 5 marks

5	(*BC* =) 96 – 30 (=66)		3	M1
	96 + (66 ÷ 3) oe			M1
		118		A1
				Total 3 marks

6		9 hours 45 mins	2	B2 B1 for 9 hours or 45 minutes
				Total 2 marks

7	(a)		(2, 3)	1	B1
	(b)		(−3, −1)	1	B1
	(c)		(−0.5, 1)	2	B2 B1 for (−0.5, *y*) or (*x*, 1) or (1, −0.5)
					Total 4 marks

Question		Working	Answer	Mark	Notes
8	(a)			3	B3 All 6 entries correct B2 for 4 or 5 correct entries B1 for 2 or 3 correct entries
	(b)		$\frac{23}{60}$	1	B1 Allow 0.38(333...) or 38(.33...)%
	(c)		$\frac{13}{33}$	2	B2 B1 for $\frac{n}{33}$ where $n < 33$ or $\frac{13}{m}$ where $m > 13$
					Total 6 marks

9	(a)			1	B1 Correct diagram
	(b)		13, 16	1	B1 Both values correct
	(c)		22	1	B1
	(d)		$C = 3P - 2$ oe	2	B2 B1 for $3P$ or $3P$ + constant (constant $\neq -2$)
	(e)		(Yes) pattern 28 has 136 triangles	1	B1 or $5 \times 28 - 4 = 136$ oe Sight of 28 is sufficient
					Total 6 marks

10	$n - 3 = 13$ oe or $n = 16$ or $(6 + m) \div 2 = 8.5$ oe or $m = 11$		2	M1
		$n = 16$ & $m = 11$		A1 Both values correct
				Total 2 marks

	small	large	total
orange	***6***	13	***19***
blue	7	***16***	23
yellow	14	***4***	***18***
total	***27***	33	60

Question	Working	Answer	Mark	Notes
11 (a)		3720	1	B1
(b)		95	1	B1
(c)	$\frac{651}{9.3} \times 4.4$		2	M1
		308		A1
				Total 4 marks

12 (a)		$4k$	1	B1	
(b) (i)		9^4	1	B1	
(ii)		3^8	1	B1	
(c)		5^{19}	1	B1	
(d)			2	M1	A factor tree / division ladder of 3 or more factors (≠1), multiplying to 800, which must include 2 and 5. Condone 1 error when product ≠ 800
		$2\times2\times2\times2\times2\times5\times5$		A1	Dep on M1 oe eg $2^5 \times 5^2$

13	$0.4 \times 75 (= 30)$ oe		4	M1	M2 for $0.6 \times 75 (= 45)$ oe
	$75 - 30 (= 45)$			M1	
	(T-Shirt =) $\frac{45-12}{2}$ or (Bag =) $\frac{45+12}{2}$ oe or $t + (t + 12) = 45$ oe			M1	(T-shirt = \$16.50)
		28.5(0)		A1	
					Total 4 marks

Question	Working	Answer	Mark	Notes
14 (a)	$\frac{40}{750}$ oe		2	M1 Numerator and denominator must be integers.
		$\frac{4}{75}$		A1
(b)	$\frac{40}{100} \times 6.8$ oe		2	M1
		2.72		A1
(c)	$\frac{3}{40} \times 100$ oe		2	M1
		7.5		A1
				Total 6 marks

15	$\angle ABC = 360^o - 298^o (= 62^o)$ or $\angle BCA = 97^o$		4	M1 Could be marked on diagram
		21		A1
	vertically <u>opposite</u>, (are equal) <u>angles</u> <u>at (around) a point,</u> (= 360°) <u>angles in a triangle</u> (= 180°)			B2 B2 for 3 correct reasons which must include the underlined words B1 for 1 or 2 correct reasons which must include the underlined words Any B marks dep on M1
				Total 4 marks

16	10 × 5 + 30 × 11 + 50 × 8 + 70 × 19 + 90 × 9 (50 + 330 + 400 + 1330 + 810)		3	M2 Correct products using midpoints (allowing one error) with intention to add. M1 for products using frequency and a consistent value within the range (allowing one error) with intention to add. or correct products using midpoint without intention to add.
		2920		A1 N.B. 2920 ÷ 52(=56.15...) gains M2 only
				Total 3 marks

Question	Working	Answer	Mark	Notes
17	$4x$ or $x - 7$		4	M1 Correct expression for B or C
	$x + 4x + x - 7 = 137$ oe			M1 Correct equation
	$x = 144 \div 6$ (=24) or $6x = 144$			M1 Gathering up the x's and numbers Dep on previous M1
		17		A1
				Total 4 marks

18	(a)		$3e^2 - 5e$	1	B1
	(b)		$5(7 + f)$	1	B1
	(c)		$64p^3q^6$	2	B2 B1 for 2 correct parts of the product
					Total 4 marks

19	$8.5^2 + 5.6^2$ (=103.61)		3	M1
	$\sqrt{8.5^2 + 5.6^2}$			M1
		10.2		A1 awrt 10.2
				Total 3 marks

20	3 hours 36 mins = 216 mins or 3.6 hours		3	M1
	$2470 \div 3.6$ or $2470 \div 216 \times 60$ oe			M1 Allow $2470 \div 3.36$ (=735 or better)
		686		A1
				Total 3 marks

21	(adding) $10x = -5$ or $21x + 35y = 42$ $21x - 15y = -33$ then $50y = 75$		3	M1 Correct method to eliminate x or y: coefficients of x or y the same **and** correct operator to eliminate selected variable or correct substitution for x or y into 2nd equation
		$x = -0.5$ oe $y = 1.5$ oe		A1 Both A marks dep on M1 A1
				Total 3 marks

Question	Working	Answer	Mark	Notes
22	$20\,000 \times 0.81^3$			M2 M1 for $20\,000 \times 0.81$ (= 16 200) or $20\,000 \times 1.19$ (= 23 800) or $20\,000 \times 1.19^3$ (= 33 703.18))
		10 629		A1 Accept 10 628 → 10.629
				Total 3 marks

23	$30 = \frac{27}{1.2x}$		3	M2 M1 for $\frac{27}{1.2x}$
		0.75		A1 oe
				Total 3 marks

24	(a)		156 000 000	1	B1
	(b)		Arctic	1	B1
	(c)		3.74×10^7	2	B2 B1 for 37 400 000 (oe but not in standard form)
					Total 4 marks

25	(a)		$-1, 0, 1, 2, 3, 4$	2	B2 B1 for $-2, -1, 0, 1, 2, 3, 4$ or $-1, 0, 1, 2, 3$
	(b)		$y \leq 6$ $x + y \geq 5$ $y \geq x - 3$	2	B2 for 3 correct inequalities B1 for 2 correct inequalities (In both cases allow < in place of ≤, and > in place of ≥)
					Total 4 marks

Question	Working	Answer	Mark	Notes
26	180 – 2 × 66 (= 48) (360 – "48") ÷ 2 (= 156) 180 – "156" (= 24) 360 ÷ "24"		3	M1 M1
	Alt : 180 – 2 × 66 (= 48) 360 ÷ (0.5 × "48")			M1 M1
		15		A1
				Total 3 marks

				Total : 100 marks

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