Mark Scheme (Results)

January 2016

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

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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
  - indep – independent
  - eeoo – each error or omission
  - awrt –answer which rounds to

- **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.

International GCSE Maths 2FR

Q	Working	Answer	Mark	Notes
1 (a)		−11,−9,−2,3,5	1	B1
(b)		0.007, 0.072, 0.7, 0.703, 0.72	1	B1
(c)		70	1	B1
(d)	8 + 12	20	2	M1 8 or 12 A1
				Total 5 marks

2 (a)		Eight thousand, two hundred and one	1	B1	
(b)		Four Hundred /4 hundred/400	1	B1	
(c)		8850	1	B1	Allow Everest
(d)		9000	1	B1	
(e)		239	1	B1	Accept −239
(f)		8516 & 8463	2	B1,B1	Allow K2 & Kangchenjunga
(g)	(8516 + 8586)/2	8551	2	M1 A1 for	(8516 + 8586)/2 or 8516 + (8586-8516)/2 oe
(h)		8.85(0)	1	B1	
					Total 10 marks

3 (a) (i)		293	1	B1
(a)(ii)		19.4	1	B1
(b)		(7−2)×(5+7)	1	B1 brackets in correct place
				Total 3 marks

4 (a)		65	1	B1 Allow 63 to 67 incl
(b)		115	1	B1 Allow 113 to 117 inlc.
(c)		obtuse	1	B1 Allow circled in box
				Total 3 marks

5 (a)		36	1	B1
(b)	22 – 8 **or** 22 and 8	14	2	M1 22 – 8 or 3 × 4 + 2 oe **or** 22 and 8 A1
	(c)	$1\frac{3}{4}$ circles drawn		
				Total 4 marks

6 (a)		B or F	1	B1 Either B or F or both
(b)		1/one	1	B1
(c)		12	1	B1
(d)		A & C	1	B1
				Total 4 marks

7 (i)		Cross labelled E at 0.5	1	B1
(ii)		Cross labelled F at $\frac{1}{2}$	1	B1
(iii)		Cross labelled G at 1	1	B1
				Total 3 marks

8		39, 10	2	B1 39 B1 10
				Total 2 marks

9 (a)		1910	1	B1
(b)		9:15 pm	2	M1 Method to add 1 hour 25 mins to 1950 or 2115 or 9:15 A1 9.15 pm
				Total 3 marks

10 (a)		15	1	B1
(b)		10	1	B1
(c)		7	1	B1
				Total 3 marks

11 (a)		$\frac{7}{15}$	1	B1 oe
(b)		0	1	B1
(c)		$\frac{12}{15}$	1	B1 oe
				Total 3 marks

12 (a)		80	1	B1 Allow 78 - 82
(b)		56	1	B1 Allow 56 - 58
(c)		880	2	M1 For correct method to convert – eg 11 × (a) or 5 × 160 +80 A1 Accept 875 - 885
				Total 4 marks

13	20 – (2 × 2.43 + 2.29 + 0.5 × 9.54)	8.08	3	M1 for subtraction of at least 2 correct values from 20 M1 20 – "11.92" A1 8.08
				Total 3 marks

14	10 × 4 × 7	280	2	M1 10 × 4 × 7 oe A1 280
				Total 2 marks

15	(a)		$4e$	1	B1
	(b)		$2c^2$	1	B1
	(c)		$5a - 4b$	2	M1 5a or -4b A1
	(d)		$14pq$	1	B1
	(e)		x^9	1	B1
	(f)		y^6	1	B1
					Total 7 marks

16	(a)		$\frac{7}{100}$	2	M1 for $\frac{175}{2500}$ oe A1
	(b)	$0.16x = 192$ or $16\% = 192$ oe or $\frac{192}{16}$ (=12)			M1
		$\frac{\mathbf{192}}{\mathbf{0.16}}$ or $\frac{\mathbf{192}}{\mathbf{16}} \times 100$ oe			M1
			1200	3	A1
					Total 5 marks

17	(a)	$8d + 12 - 6d + 10$	$2d + 22$	2	M1 A1	3 out of 4 terms correct with signs correct or 4 terms correct ignoring signs for $2d + 22$ **or** $2(d + 11)$
(b)		$5 \times 3 + (-4)^2$ oe	31	2	M1 A1	
					Total 4 marks	

18	48 ÷ 8 (=6)			M1	width of rectangle
	(8 + "6") × 2 (=28)			M1	perimeter
	"28" ÷ 4 (=7)			M1	length of side
		49	4	A1	
					Total 4 marks

19	$1\frac{24}{60}$ or 1.4 or 84			B1	for changing time to a decimal or to minutes
	$\frac{725}{1.4}$ oe or $\frac{725}{84} \times 60$			M1	allow 725 ÷ 1.24
		518	3	A1	for 518 or 517.857…
					Total 3 marks

20	(a)		15 - 19	1	B1	
	(b)	$2 \times 1 + 7 \times 5 + 12 \times 6 + 17 \times 10 + 22 \times 8$ or $2 + 35 + 72 + 170 + 176$ or 455			M2	Freq × midpoint values stated or evaluated with intention to add (condone any two errors in midpoints or frequencies). If not M2 then award M1 for all products $t \times f$ (and t is consistently within the interval, including end values) and intention to add (condone two errors).
		$\frac{2\times1 + 7\times5 + 12\times6 + 17\times10 + 22\times8}{30}$ or "455" ÷ 30			M1	(dep on at least M1) for division by 30
			15.2	4	A1	accept 15.166… rounded or truncated to 4 or more sig figs Accept 15 with working (15 without working gains M0A0) NB: accept 2.25 as mid-point for mid-interval value of 1st class (gives mean 15.175)
						Total 5 marks

21	$\frac{\mathbf{3 \times 5}}{\mathbf{20}} + \frac{\mathbf{4 \times 4}}{\mathbf{20}}$ or $\frac{\mathbf{15}}{\mathbf{20}} + \frac{\mathbf{16}}{\mathbf{20}}$			M1	for any pair of correct fractions with denominator a multiple of 20
		$\mathbf{\frac{31}{20}}$	2	A1	dependent on M1
	Alternative 0.75 + 0.8 = 1.55			M1	
		$1\frac{55}{100}$		A1	dependent on M1
					Total 2 marks

22 (a)	(40 ÷ 16) × 240 oe			M1	for a fully correct method
		600	2	A1	
(b)	(600 ÷ 120) × 16 oe			M1	for a fully correct method
		80	2	A1	
(c)	240÷150 or 150 : 240 oe			M1	
		1.6 oe	2	A1	
					Total 6 marks

23 (a) (i)		57	1	B1	
(ii)		Corresponding angles	1	B1	For correct reason
(b)	(5 – 2) × 180 or 3 × 180 or (2 × 5 −4) × 90 or 6 × 90 or 360 +180 or 540			M1	for correct method to find total of angles in a pentagon or
	‘540’ – (86+142+72+115) oe			M1	(dep) fully correct method to find *y*
		125	3	A1	cao
	Alternative method (exterior angles) 360 – (“94” + “38” + “108” + “65”) (=55) or 360 – 305 (=55)			M1	if just values seen then condone one error in exterior angles
	180 – “55”			M1	(dep) fully correct method to find *y*
		125	3	A1	cao
					Total 5 marks

24 (a)	$9y - 5y = 2 + 3$ or $4y = 5$			M1 for a correct equation with terms in y on one side and numbers on the other.
		1.25	2	A1 for 1.25 or $\frac{5}{4}$ or $1\frac{1}{4}$
(eb	$7x - 1 = 5x$			M1 multiplying x by 5 (seen as part of an equation) or showing $\frac{7}{5}x - \frac{1}{5} = x$
	eg. $7x - 5x = 1$ or $2x = 1$ or $\frac{7}{5}x - x = \frac{1}{5}$			M1 for isolating terms in x
		$\frac{1}{2}$ oe	3	A1 for $\frac{1}{2}$ or 0.5 dep on M1 scored
				Total 9 marks

25		5, 10, 20, 25, 50, 100	2	B2 If not B2 then B1 for at least 3 correct values and no incorrect values or all correct values with only 1 incorrect value
				Total 2 marks

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