Mark Scheme (Results)

Summer 2018

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

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Summer 2018
Publications Code 4MA1_2FR_1806_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.

International GCSE Maths				
Apart from question 15b (where the mark scheme states otherwise) the correct answer, unless clearly obtained from an incorrect method, should be taken to imply a correct method.				
Question	Working	Answer	Mark	Notes
1 (a)		8543	1	B1
(b)		4 digits ending in 5	1	B1 e.g. 3845, 8345 etc
(c)		3485	1	B1
				Total 3 marks

2 (a)		0.8	1	B1
(b)		$8\frac{5}{9}$	1	B1
(c)		$\frac{7}{9}$	1	B1
(d)		4.013, 4.02, 4.807, 4.81, 4.85	1	B1
(e)	0.65 + 0.72 or $\frac{65}{100}+\frac{72}{100}$ or $\frac{13}{20}+0.72$ oe	1.37	2	M1 A1 or $\frac{137}{100}$
				Total 6 marks

Question	Working	Answer	Mark	Notes
3 (a)		11	1	B1
(b)		18	1	B1
(c)		Correctly completed pictogram	1	B1 1½ symbols oe
				Total 3 marks

4 (a)		40	1	B1
(b)	$\frac{42}{80}\times 100$ oe, e.g. 42 × 1.25	52.5	2	M1 A1
(c)	0.72 × 350 oe	252	2	M1 A1
				Total 5 marks

Question	Working	Answer	Mark	Notes
5 (a)	<table><tr><th></th><th>chocolate</th><th>strawberry</th><th>vanilla</th><th>TOTAL</th></tr><tr><td>cones</td><td>16</td><td>40 .....</td><td>22</td><td>78</td></tr><tr><td>tubs</td><td>7 .....</td><td>14</td><td>21 .....</td><td>42 .....</td></tr><tr><td>TOTAL</td><td>23</td><td>54 .....</td><td>43 .....</td><td>120</td></tr></table>	Correct completed table	3	B3 fully correct table B2 for 4 or 5 correct entries B1 for 2 or 3 correct entries
(b)		$\frac{22}{120}$	2	M1 For $\frac{22}{n}$ (n > 22) or $\frac{m}{120}$ (m < 120) A1 oe, allow 0.18(33...)
				Total 5 marks

6 (a)		1800	1	B1
(b)		32 045	1	B1
(c)	2 + 5 × 7 = 2 + 35	Correct statement	1	B1 e.g. Billy should have done 5×7 and added 2 to the answer to this.
(d)		Correct sum	1	B1 e.g. 2 + 4= 6 (2 added to any even number)
				Total 4 marks

Question	Working	Answer	Mark	Notes
7 (a)		(pentagonal) prism	1	B1
(b)		7	1	B1
(c)		15	1	B1
				Total 3 marks

8 (a)		6 45 am	1	B1
(b)		3 hr 45 mins	2	M1 Attempt to count on from 0725to 0800 or to count from 0725 to 1025 oe A1
				Total 3 marks

9 (a)		2	1	B1
(b)	20 ÷ 2 (= 10^{th}) or (20 + 1) ÷ 2 (=10.5^{th})	1	2	M1 Or evidence of correct working by table or listing numbers A1
(c)	(6×0) + (5×1) + ((7×2) + (1×3) + (0×4) + (1×5) (0) + 5 + 14 + 3 + (0) +5	27	2	M1 For at least 4 correct products with intention to add. A1
				Total 5 marks

Question	Working	Answer	Mark	Notes
10	1.35 ÷ 3 (= 0.45) [4.15 − (5 × "0.45")] ÷ 2	0.95	3	M1 M1 A1
				Total 3 marks

11	(a)		7.5	1	B1 oe $\frac{15}{2}, 7\frac{1}{2}$
	(b) (i)		3.181(983516..)	2	M1 For 57.9121 or 18.2 oe A1
	(ii)		3.2	1	B1ft ft as long as (i) has at least 3 sf.
					Total 4 marks

12	(a)(i)		2,3,4,6,7,8	1	B1 All numbers and no others, in any order
	(ii)		3,4	1	B1 Both numbers and no others, in any order
	(iii)		1,5,9,10	1	B1 All numbers and no others, in any order
	(b)		$\frac{3}{10}$	2	M1 $\frac{3}{n}$ ($n > 3$) or $\frac{m}{10}$ ($m < 10$) A1 oe
					Total 5 marks

Question	Working	Answer	Mark	Notes
13 (a)(i)		70	1	B1 Accept 69 − 71
(ii)		64	1	B1 Accept 63 − 65
(b)	500 euros = (500 ÷ 50) × "70" (= 700) oe "700" × 2.7	1890	3	M1 M1 A1 1880 − 1900, ft answer to (a)(i)
				Total 5 marks

14	(−2, −1)(−1, 1)(0, 3)(1, 5)(2, 7)(3, 9)(4, 11)	Correct line between $x = -2$ and $x = 4$	3	B3 For a correct line between $x = -2$ and $x = 4$ B2 for a correct line through at least 3 of (−2, −1)(−1, 1)(0, 3)(1, 5) (2, 7)(3, 9)(4, 11) OR for all of (−2, −1)(−1, 1)(0, 3)(1, 5)(2, 7) B1 (3, 9)(4, 11) plotted, not joined. For at least 2 correct points stated (may be in a table) OR For a line drawn with a positive gradient through (0, 3) OR for a line with the correct gradient.
				Total 3 marks

Question	Working	Answer	Mark	Notes
15 (a)	$-2p = 15 - 8$ or $8 = 2p + 15$ or $\frac{8}{2} - p = \frac{15}{2}$ oe	-3.5	2	M1 A1 oe
(b)	eg $7x - 2 = 4(3x + 1)$ oe $7x - 12x = 4 + 2$ oe or $-2 - 4 = 12x - 7x$ oe	$-\frac{6}{5}$	3	M1 correct first step M1 for rearranging the x terms on one side and the numerical terms on the other. ft rearranging their expansion $ax + b = cx + d$ eg $7x - 2 = 12x + 4$ A1 oe, dep on M1
				Total 5 marks

16	eg $\frac{x+10+y}{3} = 11$ oe or $y - x = 7$ oe 3×11 (=33)	$x = 8$, $y = 15$	2	M1 for one correct equation in x and y OR finding the total of x, 10 and y OR two numbers with a sum of 23 OR two numbers with a range of 7 Note: condone non-integers for the award of M1 A1
				Total 2 marks

Question	Working	Answer	Mark	Notes
17	(area =) 2 × 1.25 (=2.5) (*F* =) 42 × "2.5" or 42 = $\frac{F}{"2.5"}$	 105	3	M1 M1 Correct substitution into pressure formula A1 cao
				Total 3 marks

18	eg (6.3 × 1000) ÷ 210 (= 30)		4	M1 for a method to find the number of candles, could work in grams or kg
	$\frac{2}{5}\times"30"\times13\,(=156)$			M1 for a method to find money made from the $13 candles
	$\left(1-\frac{2}{5}\right)\times"30"\times0.8\times13\,(=187.20)$			M1 for a method to find money made from the reduced candles
		343.2(0)		A1
				Total 4 marks

Question	Working	Answer	Mark	Notes
19 (a)	$3c - 21 + 6c + 8$	$9c - 13$	2	M1 For 3 or 4 terms correct A1
(b)	$x^2 - 2x + 7x - 14$	$x^2 + 5x - 14$	2	M1 For 3 correct terms or for 4 correct terms ignoring signs or for $x^2 + 5x + k$ for any non-zero A1 value of k or for .... $+ 5x - 14$
(c)		$7y(4y - 3)$	2	B2 B1 for $y(28y - 21)$ or $7(4y^2 - 3y)$ or $7y(4y + k)$ or $7y(ay - 3)$
				Total 6 marks

20	6h 42 min = 6.7 h or $6\frac{42}{60}$ oe or 402 (mins) or 24120 (secs) OR 10.8(33…)(km) eg 6.7 × 650 or (402 × 650) ÷ 60 or (24120 × 650) ÷ 3600 or 6 × 650 + 42 × 10.8	4355	3	B1 for converting 6h 42min into hours or minutes or seconds OR finding distance travelled in 1 minute M1 use of s × t, allow 6.42 × 650 (=4173) A1
				Total 3 marks

Question	Working	Answer	Mark	Notes
21 (a)		g^{10}	1	B1
(b)		k^{15}	1	B1
(c)		$5y^4$	2	B2 B1 for fully simplifying terms in x or terms in y
(d)	$h - f = 3e$ or $\frac{h}{3} = e + \frac{f}{3}$ or $\frac{h-f}{3}$		2	M1
		$e = \frac{h-f}{3}$		A1 oe, accept $e = \frac{f-h}{-3}$
				Total 6 marks

<table>
<tr><th>Question</th><th colspan="2">Working</th><th>Answer</th><th>Mark</th><th colspan="3">Notes</th></tr>
<tr><td rowspan="5">22</td><td>Eg $\frac{1.5}{100}\times 20\,000$ oe or 300</td><td rowspan="2">OR

$20\,000$
$\times 1.015^3$</td><td rowspan="5">

20 914</td><td rowspan="5">

3</td><td>M1</td><td>for eg $\frac{1.5}{100}\times 20\,000$ oe or 300</td><td rowspan="2">OR
M2 for $20\,000\times 1.015^3$ or20 000 × 1.015^4 or 21 227.27..

(M1 for 20 000 × 1.015^2 or 20 604.5)</td></tr>
<tr><td>$\frac{1.5}{100}$ × (20 000+’300’)= 304.5
$\frac{1.5}{100}$ × (20 000+’300’+’304.5’)
= 20913.5675</td><td>M1</td><td>for completing method</td></tr>
<tr><td colspan="2"></td><td colspan="3">Accept 1 + 0.015 as equivalent to 1.015 throughout</td></tr>
<tr><td colspan="2"></td><td colspan="3">SC: If no other marks gained, award M1 for 20 000 × 1.045 oe or 20900 or 900</td></tr>
<tr><td colspan="2"></td><td>A1</td><td colspan="2">Answers in range 20 913– 20 914</td></tr>
<tr><td></td><td colspan="2"></td><td></td><td></td><td colspan="3">Total 3 marks</td></tr>
</table>

Question	Working	Answer	Mark	Notes
23	$160^2 + 200^2$ (=65600) $\sqrt{160^2 + 200^2}$	256	3	M1 M1 A1 accept 256 − 256.2
				Total 3 marks

24	Interior angle of pentagon (180 × 3) ÷ 5 (= 108) oe Interior angle of octagon (180 × 6) ÷ 8 (= 135) oe (*CBF* =) 360 − ("108" + "135") (= 117)	31.5	4	M1 or exterior angle of pentagon = $\frac{360}{5}(=72)$ or exterior angle of octagon = M1 $\frac{360}{8}(=45)$ M1 (*CBF* =) "72" + "45" (= 117) A1
				Total 4 marks

Question	Working	Answer	Mark	Notes
25	24.3 − 16 (= 8.3) $\tan y = \frac{12.5}{"8.3"}$ or $\tan z = \frac{"8.3"}{12.5}$ OR $\sqrt{"8.3"^2 + 12.5^2}$ (= 15.004...) and $\sin y = \frac{12.5}{"15.0"}$ or $\sin z = \frac{"8.3"}{"15.0"}$ or $\cos y = \frac{"8.3"}{"15.0"}$ or $\cos z = \frac{12.5}{"15.0"}$ $\tan^{-1}\left(\frac{12.5}{"8.3"}\right)(= 56.415\ldots)$ or $\tan^{-1}\left(\frac{"8.3"}{12.5}\right)(= 33.584\ldots)$ or $\sin^{-1}\left(\frac{12.5}{"15.0"}\right)(= 56.415\ldots)$ or $\sin^{-1}\left(\frac{"8.3"}{"15.0"}\right)(= 33.584\ldots)$ or $\cos^{-1}\left(\frac{"8.3"}{"15.0"}\right)(= 56.415\ldots)$ or $\cos^{-1}\left(\frac{12.5}{"15.0"}\right)(= 33.584\ldots)$	123.6	4	M1 Forming a right angled triangle with 24.3 − 16 on one side, 8.3 may be seen on diagram M1 for a correct trig statement involving angle *CDE* or *DCE* where *E* is on the line *AD* and *CE* is perpendicular to *AD* M1 complete method to find angle *CDE* or *DCE* A1 123.5 − 123.6
				Total 4 marks