Mark Scheme (Results)

Summer 2018

Pearson Edexcel International GCSE
In Mathematics A (4MA1) 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
  - 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  If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.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.

International GCSE Maths				
Apart from questions 11, 16c (where the mark scheme states otherwise) the correct answer, unless obtained from an incorrect method, should be taken to imply a correct method.				
Question	**Working**	**Answer**	**Mark**	**Notes**
1 a		0.07	1	B1 cao
b		$\frac{4}{5}$	1	B1 cao
c		$5\frac{2}{3}$	1	B1 cao
d	840 ÷ 7 (=120) oe **or** $\frac{6}{7}\times 840$ oe **or** 0.14(2…) × 840 (=120) oe **or** 117.6	720	2	M1 A1 cao

Question	Working	Answer	Mark	Notes
2 a		Kenya	1	B1
b	67 – 27 (may be seen on bar chart)	40	2	M1 for $x - 27$ (can be implied by an answer of 39, 41) A1 cao
c	56 : 42 oe **or** 3 : 4 **or** 1 : $\frac{4}{3}$ oe	4 : 3	2	M1 **or** for an unsimplified ratio with one value correct e.g. 56 : 41, 66 : 42 **or** for 53 : 41 **or** for 3 and 4 in incorrect notation E.g. $\frac{3}{4}$ or $\frac{4}{3}$ A1 allow 1 : $\frac{3}{4}$ **or** 1 : 0.75
d	46 + 37 + 38 (=121) **or** $\frac{46}{m}$, $m > 46$	$\frac{46}{121}$	2	M1 A1 cao

Question		Working	Answer	Mark	Notes
3	i		(triangular) prism	1	B1
	ii		5	1	B1
	iii		6	1	B1
4	a		6.5	1	B1
	b		8000	1	B1
	c	6 × 1000 (=6000) **or** 475 ÷ 1000 (=0.475) 6 × 1000 ÷ 475 **or** 6 ÷ (475 ÷ 1000) **or** 12.6(3…) **or** 475 × 12 (=5700) **or** 475 × 13 (=6175)	12	3	M1 M1 or for repeated subtraction of 475 from 6000 **or** repeated addition of 475 (may work in grams or kg) A1 cao SC : B2 for an answer of 13
5	a		11*x*	1	B1
	b		20*ef*	1	B1
	c		3	1	B1
	d		17	1	B1
	e		7*t* + 6*d*	2	B2 B1 for 7*t* **or** (+) 6*d*

<table>
<tr><th>Question</th><th>Working</th><th>Answer</th><th>Mark</th><th>Notes</th></tr>
<tr><td>6 a</td><td></td><td><table>
<tr><th></th><th>UK</th><th>Africa</th><th>USA</th><th>Total</th></tr>
<tr><td>Male</td><td>14</td><td>7</td><td>2</td><td>23</td></tr>
<tr><td>Female</td><td>16</td><td>9</td><td>2</td><td>27</td></tr>
<tr><td>Total</td><td>30</td><td>16</td><td>4</td><td>50</td></tr>
</table></td><td>3</td><td>B3 If not B3 then
B2 for at least 4 correct entries
If not B2 then
B1 for at least 2 correct entries</td></tr>
<tr><td>b</td><td>$\frac{9}{50}$ or 0.18</td><td>18</td><td>2</td><td>M1 for selecting 9 (may be seen in a calculation)
A1</td></tr>
<tr><td>7</td><td>3.80 ÷ 4 (=0.95) or
0.75 × 3.80 oe (=2.85)

7.33 – 3 × “0.95” (=4.48) or
7.33 – “2.85” (=4.48)

“4.48” ÷ 2</td><td>2.24</td><td>

4</td><td>M1

M1

M1

A1 SC: Award B2 for an answer of £2.08 or £2.09</td></tr>
</table>

Question	Working	Answer	Mark	Notes
8	(angle *EAD* or *ADE* or *AED* =) 60 (angle *BCD* =) 180 – 108 (=72) (angle *BAD* =) 360 – (135 + "72" + 90) (=63) **or** (angle *BAD* =) 360 – 297 (=63) **or** (angle *EAB* =) 123	123	5	B1 may be seen on diagram M1 may be seen on diagram M1 may be seen on diagram B1 (dep on M1) for at least **one** correct reason **reason 1** : Angles on straight line add up to 180° **or** Angles on straight line add up to 180° **reason** 2 :Angles in a quadrilateral (accept 4-sided shape) add up to 360° **or** Angles in a quadrilateral (accept 4-sided shape) add up to 360° A1 for 123 and full reasons
9 a	Two readings from graph 20°C apart eg. readings from 0°C (30 – 34 °F) and 20°C (66 – 70 °F)	36	2	M1 A1 accept answer in range 34 – 38
b		No with explanation	1	B1 e.g. graph does not go through (0,0) (accept 0) **or** temperatures in °F are not proportional to temperatures in °C **or** gives counter example that doubling does not work **or** 60°C is the same as 140°F (135 – 145) **or** 15°C is not 43°F

Question	Working	Answer	Mark	Notes
10 a	12, 24, 36… **and** 20, 40, 60, … **or** 2 , 2 , 3 **and** 2 , 2 , 5 (may be on a factor tree oe)	60	2	M1 accept prime factors seen in factor tree **or** correct position in Venn diagram A1 for 60 **or** 2 × 2 × 3 × 5 oe
b	at least 3 of 2, 3, 4, 6, 8, 12 **and** at least 3 of 2, 4, 7, 8, 14, 28 **or** 2 , 2 , 2 , 3 **and** 2 , 2 , 2 , 7 (may be on a factor tree oe)	8	2	M1 accept prime factors seen in factor tree or correct position in Venn diagram A1 for 8 **or** 2 × 2 × 2 oe
11	32 ÷ 5 (= 6.4 or 6) **or** 15 ÷ 5 (=3) **or** 30 ÷ 5 (=6) "6" × "3" × "6" (=108)	No with 108	3	M1 M1 integer values must be used A1 SC: If no marks awarded then award B1 for an answer of 'yes' with 115(.2) **OR** 'yes' and 14400 and 13750

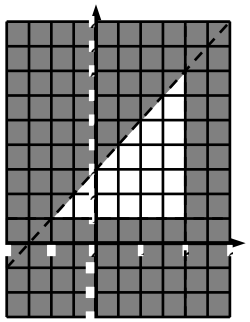
Question	Working	Answer	Mark	Notes
12 a		Reflection in $x = -1$	2	B1 for reflection B1 for $x = -1$ NB. If more than one transformation then award no marks
b		(3, –1) (3, –5) (5, –5)	1	B1 condone missing label
c		Translation $\begin{pmatrix} -2 \\ 6 \end{pmatrix}$	1	B1 NB. If more than one transformation then award no marks

Question	Working	Answer	Mark	Notes
13	170 ÷ 2 (=85) **or** 170 ÷ 2 × 7 (=595) **or** 7 ÷ 2 (=3.5)	510	5	M1
	7 × "85" + 170 (=765) **or** 9 × "85" (=765) **or** "595" + 170 (=765) **or** 170 × "3.5" + 170 (=765)			M1 award of this mark implies the first M1
	"765" ÷ 3 (=255) **or** "765" ÷ 3 × 5 (=1275)			M1 dep on M2
	"255" × 2 **or** "1275" – "765" **or** "1275" ÷ 5 × 2			M1
				A1
	Alternative scheme			
	(girls =) $\frac{2}{9}$ (of children)	510	5	M1
	(girls =) $\frac{2}{9}\times\frac{3}{5}\left(=\frac{2}{15}\right)$ (of total)			M1 award of this mark implies the first M1
	or G : C : A = $\frac{2}{9}\times\frac{3}{5}:\frac{3}{5}:\frac{2}{5}\left(=\frac{2}{3}:3:2\right)$			
	"$\frac{15}{2}$"$\times$170 (=1275) **or** G : A = 2 : 6 oe			M1 dep on M2
	"1275" ÷ 5 × 2 **or** 3 × 170			M1
				A1

Question	Working	Answer	Mark	Notes
14 a		110	1	B1 for 108 – 112
b		cross marked in correct position	3	M1 for arc drawn radius 7.8 cm – 8.2 cm centre *L* **or** *P* marked 7.8 cm – 8.2 cm from *L* **or** 40 ÷ 5 (= 8) M1 for bearing of 238 º – 242 º from *M* A1 Overlay (*P* 7.8 cm – 8.2 cm from *L* and on a bearing of 238 º – 242º from *M*)
15 a		$0 < p \leq 1$	1	B1
b	0.5 × 19 + 1.5 × 12 + 2.5 × 5 + 3.5 × 2 + 4.5 × 2 (=56) **or** 9.5 + 18 + 12.5 + 7 + 9 (=56) "56" ÷ 40	1.4	4	M2 for at least 4 correct products added (need not be evaluated) If not M2 then award M1 for consistent use of value within interval (including end points) for at least 4 products which must be added **OR** correct mid-points used for at least 4 products and not added M1 dep on at least M1 Allow division by their $\sum f$ provided addition or total under column seen A1 for 1.4 or $1\frac{2}{5}$

Question		Working	Answer	Mark	Notes	
16	a		y^{14}	1	B1	
	b		$16m^{12}$	2	B2	if not B2 then B1 for am^{12} **or** $16m^{b}$ **or** 2^4m^{12} $b \neq 0, 12$ $a \neq 1, 16$
	c	$5x + 15 = 3x - 4$ **or** $x + 3 = \frac{3x}{5} - \frac{4}{5}$ e.g. $5x - 3x = -4 - 15$	$-\frac{19}{2}$ oe	3 2	M1 M1	for removing bracket in a correct equation or dividing all terms by 5 in a correct equation ft from $ax + b = cx + d$ for correctly isolating terms in x on one side of equation and constant terms on the other side
					A1	dep on at least M1
	d (i)		$(x - 4)(x + 6)$		M1 A1	for $(x + a)(x + b)$ where either $ab = -24$ **or** $a + b = +2$ e.g $(x - 6)(x + 4)$
	(ii)		$4, -6$	1	B1	cao **or** ft from any $(x + p)(x + q)$
17	ai		1, 2, 3, 4, 6, 12	1	B1	cao
	aii		1, 3, 5, 7, 9, 10, 11	1	B1	cao
	b		Yes with reason	1	B1	e.g. no numbers in both A and C **or** A and C do not intersect **or** A and C do not overlap **or** A and C are mutually exclusive
	c		$\frac{10}{12}$ oe	2	M1 A1	for $12 - 2$ (=10) **or** $\frac{a}{12}$ with $a < 12$ **or** 10 and 12 used with incorrect notation E.g. 10 : 12 for $\frac{10}{12}$ oe **or** 0.83(3…) **or** 83(.3..)%

Question	Working	Answer	Mark	Notes
18 a		80 000	1	B1
b	$0.5 \times 10^{5-8}$ **or** 0.0005 **or** 5×10^{n} **or** 5.0×10^{n}	5×10^{-4}	2	M1 A1 for 5×10^{-4} or 5.0×10^{-4} SC : B1 for $\frac{1}{2000}$ **or** $\frac{1}{2\times10^{3}}$

Question	Working	Answer	Mark	Notes
19 a		x: −2, −1, 0, 1, 2, 3 y: −1, 1, 3, 5, 7, 9 	3	B3 For a correct line between $x = -2$ and $x = 3$ B2 For a correct straight line segment through at least 3 of (−2, −1) (−1, 1) (0, 3) (1, 5) (2, 7) (3, 9) **OR** for all of (−2, −1) (−1, 1) (0, 3) (1, 5) (2, 7) (3, 9) plotted but not joined B1 For at least 2 correct points plotted or stated (ignore incorrect points) **OR** for a line drawn with a positive gradient through (0, 3) **and** clear intention to use a gradient of 2 (eg. a line through (0, 3) and (0.5, 5) **OR** a line drawn with a gradient of 2
b			2	M1 for $x = 2$ **and** $y = 1$ drawn A1 for correct region identified NB: Region may be unshaded or shaded, condone missing label

Question	Working	Answer	Mark	Notes	
20	$9.7^2 + 3.5^2$ (=106.34)	32.4	4	M1	M1 for the use of *MN* and a correct angle (70.1… or 70.2, 19.8…) in a correct trig statement eg $\cos 70.2 = \frac{3.5}{MN}$
	$\sqrt{9.7^2 + 3.5^2}$ or $\sqrt{"106.34"}$ (=10.3…)			M1	M1 for a complete method to find *MN* eg $MN = \frac{3.5}{\cos 70.2}$ (=10.3…)
	$\pi \times$ "10.3…" **or** $2 \times \pi \times \frac{"10.3..."}{2}$			M1 dep on M2	
				A1 for answer in range 32.3 – 32.41	

Question	Working	Answer	Mark	Notes	
21 a	$\frac{4}{100} \times 160\,000$ oe (=6400)	141 558	3	M1	M2 for $160\,000 \times 0.96^3$ **or** $160\,000 \times 0.96^4$ (=135 895.44..))
	$\frac{4}{100} \times$ (160 000 – "6400") (= 6144) $\frac{4}{100} \times$ (160 000 – "6400" – "6144") (= 5898.24) 160 000 – "6400" – "6144" – "5898.24"			M1 for a complete method (condone 4 years rather than 3)	If not M2 then award M1 for $160\,000 \times 0.96$ (=153 600) **or** $160\,000 \times 0.96^2$ (=147 456)
				accept (1 – 0.04) in place of 0.96 throughout	
				A1 for 141 557.76 - 141 558 **SC** If no other marks gained, award B1 for 160 000 × 0.12 oe (=19 200) **or** 160 000 × 0.88 oe (=140 800) **or** an answer of 140 800 **or** an answer of in the range 179 978 – 179 978.24	
b	E.g. 252 000 ÷ 1.05	240 000	3	M2 If not M2 then M1 for $x \times 1.05 = 252\,000$ **or** 252 000 ÷ 105 oe A1 NB: An answer of 239 400 scores M0 M0 A0	

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