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Mark Scheme (Results)

January 2019

Pearson Edexcel International GCSE
Mathematics A (4MA1) Foundation Tier
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.
- 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.

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, 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)		7.002, 7.013, 7.04, 7.831, 7.9	1	B1
(b)		0.07	1	B1
(c)		$\frac{47}{100}$	1	B1
(d)		63	1	B1
(e)		3000	1	B1
				Total 5 marks

Question	Working	Answer	Mark	Notes
2	700 or 0.45	15	3	M1 for a correct conversion
	$\frac{700}{45}$ or $\frac{7}{0.45}$ or "0.45"			M1 Units may not be consistent ft from their incorrect conversion
	15.555.... or $\frac{140}{9}$ or $15\frac{5}{9}$			M2 for $45 \times 15 = 675$ or $0.45 \times 15 = 6.75$
				A1
				Total 3 marks

Question	Working	Answer	Mark	Notes
3	(a)	9 squares shaded	1	B1
	(b)	$7\frac{2}{3}$	1	B1
	(c)	60 ÷ 5 or 12 or 2 × 60 or 120	2	M1 A1
	(d)	$\frac{1}{4} = \frac{4}{16}$ and $\frac{1}{8} = \frac{2}{16}$ oe or $\frac{1}{4} = \frac{6}{24}$ and $\frac{1}{8} = \frac{3}{24}$ and $\frac{1}{6} = \frac{4}{24}$ oe	2	M1 or use of decimals for 0.25 and 0.125 A1 e.g. $\frac{3}{16}$ is halfway between $\frac{1}{4}$ and $\frac{1}{8}$ ($\frac{3}{16} \neq \frac{1}{6}$) oe or using second method above, 4 is not halfway between 3 and 6 or 0.1875, 0.16666... and No
4	(a)	22	1	B1
	(b)	10	1	B1
	(c)	Correctly completed pictogram	1	B1 2½ circles oe
5	(a)	-6, -5, -4, 8 10	1	B1
	(b)	15	1	B1 Allow -15
	(c)	1	1	B1
	(d)	-14	1	B1

Question	Working			Answer	Mark	Notes
6 (a)	Biology	Chemistry	Physics	Correct completed table	3	M2 for at least 4 correct entries or M1 for at least 2 correct entries A1 fully correct table.
	boys	25	5	37		
	girls	6	4	33		
	TOTAL	31	9	40		
(b)				$\frac{43}{80}$	1	B1 0.5375 or 0.538
(c)				$\frac{4}{43}$	2	M1 For $\frac{4}{n}$ ($n > 4$) or $\frac{m}{43}$ ($m < 43$) A1 Correct probability (allow 0.093(02...)) NB:penalise incorrect notation in (b) and (c) once only
7 (a)				14	1	B1
	(b)				220	2
8				8 hours 35 mins	2	B2 for (B1 for 8 hours or 35 minutes or 515 minutes)
9	(2 × 2.10) + (2 × 1.80) (= 7.80) or 20 – 8.75 (=11.25) or [20 – (‘7.80’+ 8.75)] ÷ 3 or [11.25 – 2(2.10 + 1.80)] ÷ 3			1.15	3	M1 M1 A1

Question	Working	Answer	Mark	Notes
10		Correct triangle	2	B 2 For a fully correct triangle or B1 for $BAC = 55^\circ \pm 2^\circ$ or $AC = 7 \text{ cm} \pm 2 \text{ mm}$
11 (a)		$x(3x - 1)$	1	B1
(b)		$8y + 12$	1	B1
(c)	$5 \times -3 + 4 \times 6$ or for -15 or $(+)24$	9	2	M1 oe A1
(d)	$3 \times (-4)^2 + 7 \times -4$ or for $(+)48$ or for -28	20	2	M1 oe A1
12	$9 \times 3 (=27)$ or $8 \times 5 (=40)$ or $3 \times 4 (=12)$ or $9 \times 8 (=72)$ or $5 \times 5 (=25)$ or $4 \times 5 (=20)$ $9 \times 3 + 5 \times 5$ or $5 \times 8 + 3 \times 4$ or $9 \times 8 - 5 \times 4 (=52)$ '52' $\div 14 (=3.714\dots)$ '4' $\times 9.59$	38.36	5	M1 For correct method to find area of a relevant rectangle M1 For a fully correct method to find the area of the floor M1 For a correct method to find number of tins of polish needed M1 Method to find total cost - must be a whole number of tins rounded up A1
13 (a)	$7x - x = -18 - 3$ ($6x = -21$) oe	-3.5	2	M1 Collect terms in 'x' on one side and number terms on the other. A1
(b)	$7w = t - 3$ oe	$w = \frac{t-3}{7}$	2	M1 Isolating term in w
(c)		$T = 2p + 3r$	3	A1 Must have $w =$ B3 For $T = 2p + 3r$ oe (B2 for $2p + 3r$ or $T = 3p + r$ or $T = p + 2r$ or $T = 3p + 2r$) (B1 for $2p + r$ or $p + 3r$ or $3p + 2r$ or or $3p + r$ or $p + 2r$)

Question	Working	Answer	Mark	Notes
14	$75 + (180 - 123)$ or $180 - (75 + (180 - 123))$ 132° e.g. <u>Vertically opposite angles</u> are equal. <u>Angles</u> on a <u>straight line</u> add up to 180° <u>Angles</u> in a <u>triangle</u> add up to 180° Or Vertically opposite angles are equal <u>Angles</u> on a <u>straight line</u> add up to 180° <u>exterior angle</u> of a <u>triangle</u> is equal to the <u>sum</u> of the <u>opposite interior angles</u>	132 and a full set of reasons for method used	4	M1 Correct method to find angle x A1 Correct value for x B2 For a correct full set of reasons for the method used B1 for two correct reasons for a method used.
15 (a) (b)	$2 \times 16 + 6 \times 18 + 10 \times 19 + 14 \times 27 + 18 \times 20$ $= 32 + 108 + 190 + 378 + 360$ $(=1068)$ $'1068' \div 100$	$12 < d \leq 16$ 10.68	1 4	B1 M2 $f \times d$ for at least 4 products with correct mid- interval values and intention to add. If not M2 then award M1 for d used consistently for at least 4 products within interval (including end points) and intention to add or for at least 4 correct products with correct mid-interval values with no intention to add M1 dep on at least M1 Allow division by their $\sum f$ provided addition or total under column seen A1 Accept 10, 10.7 and 11

Question	Working	Answer	Mark	Notes
16	$0.5 \times 6 \times 6 \times 5 (= 90)$ $0.5 \times \pi \times 3^2 \times 5 (= 22.5 \pi = 70.6858\dots)$ or $\pi \times 3^2 \times 5 (= 45 \pi = 141.37166\dots)$ '90' – '70.6858.....'	19.3	4	M1 Correct method for volume of A M1 Correct method for volume of B or correct volume of cylinder M1 Correct method to find the difference in the volume A1 19 – 19.4
17	(a) (b) ...40, 46,... -2, 1, 6, 13, 22, 33 46 ... $6n + 4 = n^2 - 3$ oe	$6n + 4$ e.g. 22 or 46	2 2	M1 for $6n + k$ (k may be 0 or absent) oe A1 oe eg $10 + (n - 1)6$ or $n \times 6 + 4$ M1 continuing sequence and writing at least 5 terms of 2 nd sequence – allow one error or A1 for a correct equation fit part (a) or other number in both sequences eg -2
18	$0.07 \times 10\ 800 (= 756)$ oe $10\ 800 + '756'$	11 556	3	M1 M1 A1 M2 for $1.07 \times 10\ 800$ oe
19	(a) (b) (c) (d)	$2, 4, 6, 8, 10, 12$ $8, 10, 12$ $1, 3, 5$ $\frac{9}{12}$	1 1 1 2	B1 B1 B1 M1 A1 for 9 or $\frac{m}{12}$ ($m < 12$) oe

Question	Working	Answer	Mark	Notes
20 (a)		12.35	1	B1 or 12.349̇
(b)		12.25	1	B1
21	$6000 \times 0.015 (= 90)$ or $6000 \times 1.015 (= 6090)$ $(6000 + '90') \times 0.015 (= 91.35)$ $('6090' + '91.35') \times 0.015 (= 92.72)$ $('6090' + '91.35' + '92.72') \times 0.015$ $(= 94.11..)$	368.18	3	M1 or for $\frac{4 \times 1.5}{100} \times 6000 (=360)$ or 6360 M1 for complete method (4 years) for total value or sight of 6368..... A1 accept 368 – 368.20
22	$\tan '35' = \frac{x}{15}$ or $\tan '55' = \frac{15}{x}$ $x = 15 \times \tan '35' (= 10.5...)$ or $x = \frac{15}{\tan '55'}$ (= 10.5...) 10.5 + 37	47.5	4	M1 Forming a right-angled triangle with angle 125 – 90 marked or 55 marked M1 M1 A1 Awrt 47.5

Question	Working	Answer	Mark	Notes	
23	$360 \div 8 (= 45)$ or $180 - (360 \div 8) (= 135)$ or $\frac{6 \times 180}{8} (= 135)$ oe e.g. $\frac{540 - 112 - 112 - 84}{2} (= 116)$ or $\frac{540 - 308}{2} (= 116)$ or $\frac{232}{2} (= 116)$ e.g. '135' - '116' or $180 - '116' - '45'$	19	4	M1 Correct method to find the interior or exterior angle of octagon M1 Correct method to find a missing angle from pentagon M1 Complete method A1	
24	$1 + 0.65 + 1.22 (= 2.87)$ or $100 + 65 + 122 (= 287)$ $861 \div 2.87$ or $(861 \div 287) \times 100$ oe	300	3	M1 oe Note: $863 \div 3 = 287$ is M0 M1 A1	
25 (a)		$4d^2e(3 + 4e)$	2	B2	B1 for correct partial factorisation with at least one correct factor B1 for an answer in the form $ak^x m^y$ with 2 correct from $a = 3, x = 3, y = 1$
(b)		$3k^3m$	2	B2	