Mark Scheme (Results)

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

  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 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.

Apart from Questions 13(b) and 13(c) (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)		36, 73, 89, 138, 219	1	B1
	(b)		2018	1	B1
	(c)		Four thousand three hundred and nine	1	B1
	(d)		700	1	B1 oe
					eg 100
	(e)		290	1	B1
	(f)	$\frac{4}{5} \times 185$ or 0.8×185 oe	148	2	M1 For a complete method
					A1
2	(a)		3	1	B1
	(b)(i)		4	1	B1
	(b)(ii)		12	1	B1 for 12 **or** ft from (i) for "4" × 3
	(b)(iii)		18	1	B1 for 18 **or** ft from (i) for "4" × 4.5

Question		Working	Answer	Mark	Notes
3	(a)(i)		14	1	B1
	(a)(ii)		Added 4	1	B1 Accept +4, 4 more, jumped forward by 4, difference = 4 or sight of $4n - 2$
	(b)		34	1	B1
	(c)	$(59 + 1) \div 5$ or $59 = 5n - 1$ **or** 4, 9, 14, 19,……, 54, 59 (may start at 34 or 39)			M1 or for $12 \times 5 - 1$
			12	2	A1
4	(a)	$4.74 - 1.80 \ (= 2.94)$ **or** $474 - 180 \ (= 294)$			M1
				3	
		"2.94" $\div 2$ **or** "294" $\div 2$			M1 dep
			£1.47		A1
	(b)	$2 \times 25 + 30$ or 80 (pence) or $2 \times 0.25 + 0.30$ **or** E.g. $10 \times 25 + 5 \times 30 \ (= 400)$			M1 for method to find total cost of twice as many apples as oranges May work in pence or pounds throughout
		$5 \div "0.8"$ **or** $500 \div "80"$ **or** 6.25 **or** $12 \times 25 + 6 \times 30 \ (= 480)$ **or** $4.8(0)$			M1
			12	3	A1

Question		Working	Answer	Mark	Notes	
5	(a)		37	1	B1	
	(b)	Eg 9, 10, 12, 17, 19, 26, 27, 46 (may be in descending order)			M1	for all 8 numbers in order or 17 and 19 identified
			18	2	A1	
	(c)	$(26+10+17+27+12+19+9+46) \div 8$			M1	for a correct method (condone missing brackets)
			20.75	2	A1	Accept 21 if correct calculation shown

Question		Working	Answer	Mark	Notes
6	(a)		21 30	1	B1
	(b)		9 hours 20 minutes		B2 If not B2 then award B1 for …. hours 20 mins **or** 9 hours ….. mins **or** a duration equivalent to 9hr 20 min eg. 560 mins
	(c)	$\dfrac{327}{5.5}$ oe **or** $\dfrac{327}{330} \times 60$ oe			M2 for a complete method if not M2 then award M1 for $\dfrac{327}{5.3}$ oe **or** 61.6(98113...) **or** 62 **or** for $\dfrac{327}{330}$ **or** 0.99(0909...) oe
			59	3	A1 for 59 – 59.5

Question		Working	Answer	Mark	Notes
7	(a)		97	1	B1
	(b)		729	1	B1
	(c)		19	1	B1
	(d)(i)	$\dfrac{\sqrt{91.21}}{2.46} = \dfrac{9.55...}{2.46}$			M1 for 9.55(039...) **or** 2.46 **or** 91.21 **or** 3.8 **or** 3.9 **or** 3.88 **or** 3.882
			3.8822 (7344)	2	A1
	(d)(ii)		3.9	1	B1 ft if at least 2dp in (i)
8	(a)				M1 for $6e$ or $-10f$
			$6e - 10f$ oe	2	A1 do **not** award if in incorrect attempt at simplification is seen eg $-4ef$
	(b)	$20x + 15 - 3x + 1$			M1 for 3 correct terms
			$17x + 16$	2	A1 SC : B1 for $5x + 20$
	(c)		$2p(2 + 3q)$	2	B2 If not B2 then award B1 for $2(2p + 3pq)$ **or** $p(4 + 6q)$ **or** $2p$(a two term expression) **or** $x(2 + 3q)$ where $x \neq 2p$

Question		Working	Answer	Mark	Notes
9	(a)	Eg $6 \times 3 - 2 \times -5$ **or** 18 **and** $(-)10$	28	2	M1 for correct substitution A1
	(b)	Eg $2 - 15 = 2p$ **or** $2p = -13$ oe **or** $p = \dfrac{B - 3m}{2}$	$-\dfrac{13}{2}$ oe	2	M1 for isolating $2p$ in a correct equation A1
10	(a)		$\dfrac{3}{16}$ oe	1	B1
	(b)	$13 \times 18 \div 3$ or 13×6			M1
			78	2	A1

Question	Working	Answer	Mark	Notes
11	$\dfrac{2}{7} \times 70$ (=20) **or** $\dfrac{1}{5} \times 70$ (=14)			M1
	$\dfrac{2}{7} \times 70$ (=20) **and** $\dfrac{1}{5} \times 70$ (=14) **or** 34			M1
	$\dfrac{4}{9} \times (70 - "34")$ (=16)			M1
		$\dfrac{16}{70}$ oe	4	A1 SC: if no marks awarded, award B2 for 65
	Alternative scheme			
	$\dfrac{2}{7} + \dfrac{1}{5}$ oe $\left(= \dfrac{17}{35} \right)$ **or** $0.28(57\ldots) + 0.2\ (= 0.48(57\ldots)$			M1 may work in percentages
	$1 - \dfrac{"17"}{35}$ oe $\left(= \dfrac{18}{35} \right)$ **or** $1 - "0.48"$ (=0.514…)			M1 may work in percentages
	$\dfrac{4}{9} \times "\dfrac{18}{35}"$ **or** $\dfrac{4}{9} \times "0.514"$ **or** $\dfrac{4}{9} \times "\dfrac{18}{35}" \times 70 (=16)$			M1 may work in percentages
		$\dfrac{16}{70}$ oe		A1 SC: if no marks awarded, award B2 for 65

Question	Working	Answer	Mark	Notes
12	$(-1,-5),(0,-3),(1,-1),(2,1),(3,3),(4,5)$	Correct line	3	**B3** for a correct line between $x = -1$ and $x = 4$ If not B3 then B2 for a line segment through at least 3 of $(-1,-5),(0,-3),(1,-1),(2,1),(3,3),(4,5)$ **or** all points correctly plotted **or** a line drawn through $(0,-3)$ and with clear intention to use gradient of 2 E.g. a line through $(0, -3), (0.5, -1)$ If not B2 then B1 for at least 2 correct points stated or plotted (ignore incorrect points) **or** a line drawn with a positive gradient through $(0,-3)$ **but not a line through (0.−3) and (2, 0)** **or** a line with gradient 2

Question		Working	Answer	Mark	Notes
13	(a)	$e^2 + 3e - 5e - 15$			M1 for 3 correct terms **or** for 4 correct terms ignoring signs **or** $e^2 - 2e + k$ for non-zero k **or** $\ldots - 2e - 15$
			$e^2 - 2e - 15$	2	A1
	(b)	$5y = 2y + 1$ **or** $y = \dfrac{2y}{5} + \dfrac{1}{5}$			M1 for a correct first step
		E.g. $5y - 2y = 1$ **or** $3y = 1$ **or** $3y - 1 = 0$ **or** $\dfrac{3y}{5} = \dfrac{1}{5}$			M1 for collecting terms in y in a correct equation
			$\dfrac{1}{3}$ oe	3	A1 dep on at least M1 for $\dfrac{1}{3}$ oe **e.**g. $0.\dot{3}$, $0.3333\ldots$
	(c)	$(x+6)(x-3)(=0)$ **or** $x(x+6) - 3(x+6) \ (=0)$ **or** $x(x-3) + 6(x-3) \ (=0)$ $(x+6)(x-3)(=0)$ **or** for $x + 6 = 0$ oe **and** $x - 3 = 0$ oe			M1 for $(x \pm 6)(x \pm 3)(=0)$ **or** for $(x + a)(x + b)$ with $ab = -18$ **or** $a + b = 3$
					A1 for correct factors
			$x = -6, x = 3$	3	B1 ft dep on at least M1

Question	Working	Answer	Mark	Notes
14 (a)	$1236.5 - 1126.5$ **or** 110 **or** $\dfrac{1236.5}{1126.5}$ **or** $1.09(7647...)$ **or** $\dfrac{1236.5}{1126.5} \times 100$ **or** $109(.7647...)$ $\dfrac{1236.5 - 1126.5}{1126.5}$ **or** $\dfrac{"110"}{1126.5}$ **or** $\left(\dfrac{1236.5}{1126.5} - 1\right)$ **or** $\left(1.09\left(764...\right) - 1\right)$ **or** $\dfrac{1236.5}{1126.5} \times 100 - 100$ **or** $0.0976(475...)$			M1 M1 for method that would result in 9.76… or 0.0976…
		9.76	3	A1 for 9.76 - 9.765
(b)	1126.5×1.19 oe			M2 if not M2 then award M1 for $\dfrac{19}{100} \times 1126.5$ oe **or** $214(.035)$
		1341	3	A1 for 1340 – 1342

Question	Working	Answer	Mark	Notes
15 (a)	$0.15 + 0.26$	0.41 oe	1	B1
(b)	$1 - (0.15 + 0.26 + 0.33)$ **or** $1 - 0.74 \ (=0.26)$			M1 can be implied by two values where P(brown) + P(yellow) = 0.26 (may be seen in table)
	$(P(yellow)=) \dfrac{"0.26" - 0.06}{2}$ **or** 0.1			M1 for a complete method to find P(yellow)
	$150 \times "0.1"$			M1 independent mark Award for $150 \times p$ where $0 < p < 1$
		15	4	A1 NB: An answer of $\dfrac{15}{150}$ scores M3 A0

Question	Working	Answer	Mark	Notes
16 (a)		Rotation, 90° clockwise, centre $(-2, 3)$	3	B1 for rotation B1 90° clockwise or −90º (or 270º anticlockwise) B1 (centre) $(-2, 3)$ Note: Do not accept $\begin{pmatrix} -2 \\ 3 \end{pmatrix}$ for centre Award no marks if more than one transformation explicitly stated (the sight of a vector is **not** a second transformation) eg. moved and then rotated; rotation and translation
(b)		Triangle at $(-2, 2)$, $(-2, 4)$, $(-1, 4)$	1	B1 cao
(c)		Triangle at $(-2, 1)$, $(-2, 3)$, $(-1, 3)$	2	B2 If not B2 then award B1 for a triangle of the correct size and orientation **or** the wrong size but enlarged correctly from (-4, 2) with a sf other than 0.5 e.g. a triangle at $(4, -2)$, $(4, 6)$, $(8, 6)$
17	$\dfrac{\pi \times 6^2}{2}$ oe **or** 56.5(4866....) **or** 18π $\dfrac{1}{2} \times 8 \times (6-1)$ or 20 oe			M2 If not M2 then award M1 for $\pi \times 6^2$ oe (= 113(.09)) **or** 36π M1 for the area of the triangle
		36.5	4	A1 for 36.5 – 36.6

Question	Working	Answer	Mark	Notes
18 (a)		71 800 000	1	B1
(b)	Eg $1.88 \times 10^7 + 3.10 \times 10^8 + 2.64 \times 10^8 + 7.18 \times 10^7$ **or** 18 800 000 + 310 000 000 + 264 000 000 + 71 800 000 with at least 3 numbers correct			M1 for a complete method **or** for digits 6646
		6.646×10^8 oe	2	A1 for 6.646×10^8 oe eg 664 600 000
(c)		9.88×10^6	1	B1
19	$\tan 20^\circ = \dfrac{AB}{12.6}$ $(AB =) 12.6 \tan 20$ **or** $4.58(602...)$ **or** 4.6			M1 or for $AD = 12.6/\cos20$ $(=13.4..)$ **and** $12.6^2 + AB^2 = 13.4^2$ M1 or for $(AB =)\sqrt{13.4^2 - 12.6^2}$
	$(BC^2 =) 19.3^2 - 12.6^2$ **or** $372.49 - 158.76$ **or** $213(.73)$			M1
	$(BC =)\sqrt{19.3^2 - 12.6^2}$ **or** $\sqrt{"213.73"}$ **or** $14.6(195...)$			M1
		19.2	5	A1 for 19.19 – 19.21

Question	Working	Answer	Mark	Notes
20	$\dfrac{20}{8}$ oe **or** 2.5 oe **or** $\dfrac{8}{20}$ oe **or** 0.4 oe Eg $6.4 \times \dfrac{20}{8} + 6.4$ **or** $CE = 6.4 \div \dfrac{8}{20} + 6.4$	 22.4	 3	M1 for a correct scale factor M1 for a complete method to find *BE* A1