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Mark Scheme (Results)

January 2021

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

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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
- awrt – answer which rounds to
- 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, mark the method that leads to the answer on the answer line; where no answer is given on the answer line, award the lowest mark from the methods shown.

  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.

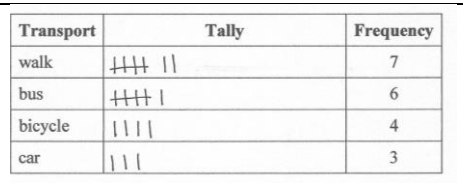
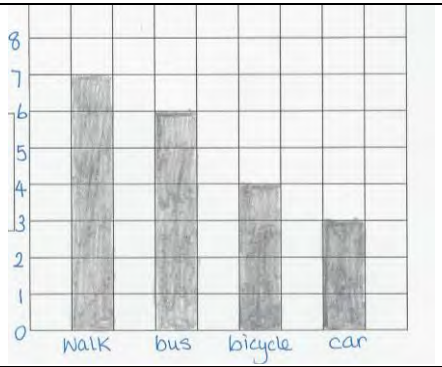
  It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect eg algebra.

  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 to another.

International GCSE Maths					
The correct answer, unless obtained from an incorrect method, should be taken to imply a correct method.					
Question		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		44	1	B1
	(b)		6	1	B1
	(c)		36	1	B1
	(d)		17	1	B1
	(e)		8, 76	1	B1 Must have both and no others
					Total 5 marks

2	(a)			2	B2 for all correct frequencies (B1 for 2 or 3 correct frequencies or 2, 3 or 4 correct tallies with no frequencies (or incorrect frequencies) or frequencies written as probabilities with 2, 3 or 4 correct numerators)
	(b)			3	B2 ft For 4 correct bars ft from table (B1ft for 2 or 3 correct bars ft from table) B1 For clear labels for bars and linear scale starting at 0 oe Condone bars of different widths
					Total 5 marks

3	(a)		14	1	B1
	(b)		−19	1	B1
					Total 2 marks

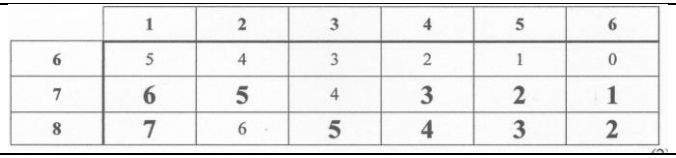
4	(a)	$0.3 \times 30\ (=9)$ **or** $\frac{1}{3}\times 30 (=10)$ **or** $\frac{1}{3}+\frac{30}{100}\left(=\frac{19}{30}\right)$oe **or** 0.333…+ 0.3(=0.63…) **or** 33.3…(%) + 30(%)oe (=63.3…)(%)		3	M1	Allow 9 squares clearly indicated for 30% or 10 squares clearly indicated for $\frac{1}{3}$
		"9" and "10" or 19 shaded squares on diagram **or** $\left(1-"\frac{19}{30}"\right)\times 30$ **or** $(1 - 0.63\ldots)\times 30$			M1	Allow squares with crosses or other indication of 'shading' such as '*y*' or '*b*'
			11		A1	
	(b)	eg 76% (25%) 7.66% (8%) 2.6% or (0.76) 0.25 (0.0766) 0.08 (0.026)		2	M1	All values written as % or all written as decimals or 4 values in correct order or all values in correct reverse order
			0.026, 0.0766, 8%, 25%, 0.76		A1	Any form
						Total 5 marks

5	(a)		13	1	B1	
	(b)	160 × 2 (=320)or "160 × 2" – 5 or "160 × 2 – 5" ÷ 3	105	2	M1	One correct inverse operation used
					A1	
	(c)		$P = \frac{3n+5}{2}$	2	B2	oe (B1 for $\frac{3n+5}{2}$ oe or $P = 3n + 5 \div 2$ or for P = a formula including n with 2 operations correct eg $P = 3n + 5$ or for $n = \frac{2P-5}{3}$ or $P = \frac{2n-5}{3}$)
						Total 5 marks

6	(a)		12	1	B1	
	(b)		8	1	B1	
	(c)	Two intersecting arcs with equal radius		2	M1	For arcs that intersect within guidelines or correct equilateral triangle drawn without arcs
			Correct equilateral triangle with arcs		A1	
						Total 4 marks

7	(a)		$6p$	1	B1	
	(b)		$8y^2$	1	B1	
	(c)		e^5	1	B1	
	(d)		$20cd$	1	B1	
	(e)		26	1	B1	
	(f)	$424 = 4n$		2	M1	For 424 or 324 + 225 –125 with at most one error
			106		A1	SCB1 for 524 or 674
	(g)		$3(3t - 2)$	1	B1	
						Total 8 marks

8		3 kg = 3000 g or 150 g = 0.15 kg or 180 g = 0.18 kg or 1350 g = 1.35(0) kg		3	B1	may be seen used as part of a calculation
		3 × 150 + 5 × 180 (= 1350) 3 × 0.15 + 5 × 0.18 (=1.35(0))			M1	Could use their converted values
			1650		A1	
						Total 3 marks

9	(a)			2	B2	B2 for all scores completed correctly. B1 for 6, 7, 8 or 9 scores completed correctly
	(b)		$\frac{15}{18}$	1	B1ft	oe ($\frac{5}{6}$ or 0.83(33...) or 83.(33..)%) ft from complete table
	(c)		$\frac{9}{18}$	1	B1ft	oe Penalise incorrect notation once only ft from complete table
						Total 4 marks

	1	2	3	4	5	6
6	5	4	3	2	1	0
7	**6**	**5**	4	**3**	**2**	**1**
8	**7**	6	**5**	**4**	**3**	**2**

10		$4x + 6x + 11 + 9x - 18 = 126$ oe eg $19x - 7 = 126$ or eg $(126 + 18 - 11) \div 19$		4	M1	A correct equation or a correct calculation for x
		$x = 7$			A1	
		$0.5 \times (9 \times$ "7" $- 18) \times (4 \times$ "7") $(0.5 \times 45 \times 28)$			M1	Dep on M1
			630		A1	cao
						Total 4 marks

11		*ABD* = 180 – 143 (= 37) **or** *AEJ* = 76 **or** *CED* = 76 **or** *ECD* = 180 – 143 (= 37)		3	M1	may be marked on diagram
		180 – 76 – "37"			M1	A correct calculation for *EDC*
			67		A1	
						Total 3 marks

12		438 × 0.12 (= 52.56) **or** 44.39 ÷ 0.92 (= 48.25)		4	M1	
		438 × 0.12 (= 52.56) **and** 44.39 ÷ 0.92 (= 48.25) **or** 438 × 0.12 (= 52.56) **and** "52.56" × 0.92 (=48.355) or 44.39 ÷ 0.92 (= 48.25) **and** "48.25" ÷ 0.12 (= 402.083…)			M1	
		"52.56" – "48.25" **or** "48.355" – 44.39 = 3.965 **and** "3.965" ÷ 0.92 **or** 438 – "402.083…"(= 35.916..) **and** "35.916" × 0.12			M1	Dep on M2
			4.31		A1	
						Total 4 marks

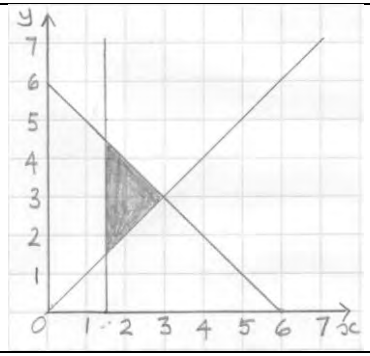
13	(a)		209	1	B1
	(b)			2	M1 For showing or stating N*TR* = 180 – 125 = 55°(where N is North at *T*) or S*RT* = 180 – 125 = 55° (where S is South at *R*) or *RT*S = 125°(where S is south of *T*) or N*T*(SE) = 125°(where N is north of *T* and SE is South-East of *T*) or for 360 – (180 – 125) or 180 + 125
			305		A1
					Total 3 marks

14	(a)	0.5 × (13.5 + 17) × 10.4	158.6	2	M1 for a complete method eg rectangle ±2 triangles
					A1 allow 159
	(b)	15.5 × 8 (=124) or 15.5 × 8 × *x* 15.5 × 8 × *x* = 806	6.5	3	M1
		806 ÷ "124"			M1 dep
					A1
					Total 5 marks

15	6 hrs 39 mins = 6.65 (hrs) or $6\frac{39}{60}$ or $6\frac{13}{20}$ or $\frac{133}{20}$ or 399 (mins)		3	B1
	Average speed = $\frac{429}{6.65}$ oe eg $\frac{429}{399}\times 60$			M1 Use of *S* = *D* ÷ *T* (use of their time in hours) [Allow $\frac{429}{6.39}$ if B0 awarded]
		64.5		A1 awrt 64.5
				Total 3 marks

16		3, 7, 8, 8 and one of 4 or 5 or 6		B3 For a list of 5 correct numbers (B2 for a list of 5 numbers with 2 of: median of 7, mode of 8, range of 5 B1 for a list of 5 or 6 numbers with 1 of: median of 7, mode of 8, range of 5)	
					Total 3 marks

17	(a)	$520 - 465\ (= 55)$ **or** $\frac{520}{465}\ (=1.118\ldots)$	11.8	3	M1	
		$\frac{"55"}{465} \times 100$ **or** $100 \times$("1.118" – 1) oe			M1	
					A1 11.8 or better (11.827956...)	
	(b)	$0.12 \times 550\ (= 66)$	484	3	M1 oe	M2 for 0.88×550
		550 – "66"			M1	
					A1	
						Total 6 marks

18	(a)(i)		Correct line	1	B1	For $x = 1.5$ drawn
	(ii)		Correct line	1	B1	For $y = x$ drawn
	(iii)		Correct line	1	B1	For $x + y = 6$ drawn
	(b)		Correct region	1	B1	dep on B3 for correctly shading the region **R** accept unlabelled or unshaded if clear. Shading can be 'in' or 'out'.
						Total 4 marks

19	(a)	$8x^2 + 20x - 6x^2 + 9x$	$2x^2 + 29x$	2	M1	3 correct terms or all 4 terms condoning incorrect signs
					A1	
	(b)	$y^5 \times y^n = y^{19}$ or $y^{-1} \times y^n = y^{13}$ or $5 + n - 6 = 13$	14	2	M1	Use of 1 rule of indices or a correct equation in n
					A1	Accept y^{14}
	(c)(i)	$7t - 2t < 7 + 8$ oe eg $5t < 15$ oe	$t < 3$	2	M1	Terms in t on one side and number terms the other side – may be in an equation or the incorrect inequality sign or an answer of $t = 3$ or eg $t \geq 3$
					A1	Must be a correct inequality given as answer
	(ii)		open circle at $t = 3$ and a line with an arrow to the left	1	B1ft	Allow a line without an arrow if it reaches to at least −5, with an arrow it can be any length
						Total 7 marks

20	(a)		1	1	B1	
	(b)	$3\times10^{125}+2\times10^{124}$ **or** digits 1024×10^{n} oe		3	M1	
		32×10^{124} **or** $3\times10^{125}+0.2\times10^{125}$ **or** $30\times10^{124}+2\times10^{124}$			M1	oe 'correct' answer in incorrect form.
			3.2×10^{125}		A1	
						Total 4 marks

21		5×398 (= 1990) or 6×401 (= 2406)		3	M1	Correct total for 5 or for 6 cocoa pods
		"2406" – "1990"			M1	(M2 for $398+6\times3$ or $401+5\times3$)
			416		A1	
						Total 3 marks

22		$8^2 + 15^2$ (= 289)	167	5	M1
		$\sqrt{8^2 + 15^2}$ (=17)			M1
		$\pi \times "8.5"^2$ (226.98...) **or** 0.5 × 15 × 8 (= 60)			M1
		$\pi \times "8.5"^2$ – 0.5 × 15 × 8 ("226.98" – "60")			M1
					A1 Accept answers which round to 167
					Total 5 marks

23			$2^4 \times 3^2 \times 5^4 \times 11 \times 13$	2	B2 (B1 for 12 870 000 or correct unsimplified product or $2^m \times 3^n \times 5^p \times 11 \times 13$ with at least 1 of *m*, *n* or *p* correct or for $2^4 \times 3^2 \times 5^4$)
					Total 2 marks

24		eg $\frac{4}{5}\times\frac{3}{7}(=\frac{12}{35})$oe **or** $0.24\times\frac{4}{7}(=\frac{96}{700})$oe **or** eg $\frac{4}{5}\times 3(=\frac{12}{5}=2.4)$ **and** $0.24\times 4(=\frac{24}{25}=0.96)$ (or 3.36) **or** eg $\frac{4}{5}\times 300(=240)$ **and** $0.24\times 400(=96)$ (or 336)		3	M1
		eg $"\frac{12}{35}"+"\frac{96}{700}"\left(=\frac{336}{700}\right)$ oe **or** $\frac{"2.4"+"0.96"}{3+4}\left(=\frac{3.36}{7}\right)$ oe **or** eg $\frac{"240"+"96"}{300+400}\left(=\frac{336}{700}\right)$ oe			M1 or 0.48 or 48% or correct unsimplified fraction eg $\frac{84}{175}$
			$\frac{12}{25}$		A1 cao
					Total 3 marks

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