GradeMax



Mark Scheme (Results)

November 2024

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					
All figures in inverted commas must come from a correct method previously seen unless otherwise stated.					
Q		**Working**	**Answer**	**Mark**	**Notes**
1	(a)		7800	1	B1
	(b)(i)		10 000	1	B1 10000, 10,000 in the box
	(b)(ii)		1000	1	B1 1,000 in the box could be in the area around the box
	(c)		Any four from 1, 2, 3, 6, 9, 18	1	B1 Can be 4 or more than 4 but all must be in this list If only 4 values there cannot be a repeated value
	(d)		17	1	B1 Could be clearly shown in list – eg circled or underlined with no other number indicated
					Total 5 marks

2	(a)(i)		31	1	B1	(might write more eg 31, 35, 39…)
	(a)(ii)	'The difference between the numbers is 4' is not sufficient	+4	1	B1	add 4, it goes up in 4, 27 + 4, $4n + 7$ can be awarded for +4 seen joining numbers in list
	(b)	71 and 75 identified		2	M1	
		Correct answer scores full marks (unless from obvious incorrect working)	146		A1	
	(c)	• The sequence goes 95, 99 • 98 is even • (23rd term is) 99 not 98 • It jumps straight to 99 • It cannot be an even number • It can only be an odd number • Because the sequence goes up in 4's and starts with an odd number • $(98 – 7) \div 4$ is not a whole number • All the numbers in the sequence are not divisible by 2 and this is • The formula is $4n + 7$ • All of the numbers in the sequence end with 1, 3, 5, 7 or 9	eg all the numbers in the sequence are odd numbers	1	B1	
						Total 5 marks

3	(a)	Allow 21 thousand	21	1	B1	Could be written at the top of the bar for Egypt if not on answer line
	(b)		12	1	B1	
	(c)		Bar completed to show 17 thousand	1	B1	Bar can be of any width
						Total 3 marks

4	(a)		9 squares (3 columns) shaded	1	B1	Any 9 squares shaded.
	(b)		$\frac{18}{24}, \frac{12}{16}$	2	B2	For both and no others. B1 for one correct with no more than one incorrect
	(c)		$3\frac{3}{7}$	1	B1	Must be written like this and not as a decimal
	(d)	Accept 90% in answer space	90	1	B1	Allow 'ninety'
	(e)	$\frac{2}{5}\times 80$ oe or $1-\frac{2}{5}\left(=\frac{3}{5}\right)$ or ÷5, ×3 or 32		2	M1	we would accept $\frac{32}{80}$ or $\frac{48}{80}$ for M1
		Correct answer scores full marks (unless from obvious incorrect working)	48		A1	
						Total 7 marks

5	(25 + 1) ÷ 2 (=13) or 18,18,19,19,19,19,20,20,20,20,20,21,21… etc with no more than one error 2, 6, 11, 17…. or 8, 14		2	M1	For a correct method to find position of median; allow 12.5 or a list – need to go up to 2nd 21 or down to this 2nd 21 or adding the frequencies cumulatively
	Correct answer scores full marks (unless from obvious incorrect working)	21		A1	from correct working
					Total 2 marks

6	250 ÷ 14 (= 17.85….) or 17 or 18 or 14 + 14 ….. + 14 (seventeen or eighteen times) oe		3	M1
	17 × 14 (= 238)			M1 This mark assumes previous M1
	Correct answer scores full marks (unless from obvious incorrect working)	12		A1
				Total 3 marks

7	3.5 km = 3500 m or 950 m = 0.95 km or 1.8 km = 1800 m or 1200 m = 1.2 km or 8 km = 8000 m		4	B1	for one correct conversion
	3.5 + "0.95" + 1.8 + "1.2" (= 7.45) or "3500" + 950 + "1800" + 1200 (= 7450)			M1	can gain this mark for adding their converted figures even if incorrect but some attempt must have been made to convert 2 relevant values. (eg incorrect but 350 + 950 + 180 + 1200)
	8 – "7.45" (= 0.55) or 8000 – "7450"			M1ft	Correct compatible units ft their total dep on Marion's distance being less than Talha's
	Correct answer scores full marks (unless from obvious incorrect working)	550		A1	
					Total 4 marks

8	(a)		$11g - 2h$	2	B2	B1 for one correct term (B1 for 11g + − 2*h*)
	(b)		$28am$	1	B1	oe
	(c)	$5x = 12 + 7$ oe or $(12 + 7) \div 5$		2	M1	A correct equation with number terms one side and *x* the other **or** for a correct process to find *x*
		Correct answer scores full marks (unless from obvious incorrect working)	3.8		A1	oe $\frac{19}{5}$ or $3\frac{4}{5}$
	(d)		$35k + 15$	1	B1	or $15 + 35k$ allow $35x + 15$
	(e)		$3(3y + 4)$	1	B1	allow $3(3y + 4$ or $3(3x + 4)$
	(f)	$3c$ (allow $3 \times c$ or $c3$) or $c + 7$		3	M1	allow $3c + 7$
		$c + 3c + c + 7$			M1	correct unsimplified expression
		Correct answer scores full marks (unless from obvious incorrect working)	$5c + 7$		A1	allow $5 \times c + 7$
						Total 10 marks

9		5 (hours) 50 (minutes)	2	B1, B1	
					Total 2 marks

10	9 × 12 × 25 oe		2	M1
	Correct answer scores full marks (unless from obvious incorrect working)	2700		A1
				Total 2 marks

11	*ACB* = 53 or *ACD* or *BCE*= 180 – 53 (= 127) (must be seen on diagram or the angle stated) **or** 180 – (77 + 53)		2	M1	for *ACB* or a correct calculation for *ACD* or *BCE* **or** a correct calculation for *x*
	Correct answer scores full marks (unless from obvious incorrect working)	50		A1	
					Total 2 marks

12	240 ÷ (5 + 3) (= 30)	0.64 × 5 (= 3.2) or "0.36" × 5 + 3 (=4.8)	0.64 × 240 (= 153.6) allow 153 or 154		4	M1	M2 for $\frac{5}{8}\times 240 (=150)$
	5 × "30" (= 150) [may see 150 : 90]	240 ÷ (5 + 3) (= 30) or $\frac{"3.2"}{8}\left(=\frac{2}{5}\right)$ $\frac{"4.8"}{8}\left(=\frac{3}{5}\right)$ **"3.2" or "4.8" must be seen previously**	"153.6" ÷ (5 + 3) (= 19.2)			M1	
	0.64 × "150" or 1.5 × 64 150 – 150 × 0.36 (150 – 54)	"3.2" × "30" or $\frac{2}{5}\times 240$ or $240-\frac{3}{5}\times 240$	"19.2" × 5			M1	For a fully correct method all figures must come from correct working
	Correct answer scores full marks (unless from obvious incorrect working)			96		A1	cao 150 – 96 (96 must be seen) is M3 (SCB2 if no other marks awarded award for 95.625 or 96.25)
							Total 4 marks

13 (a)			2	M1	for 2.4544 or 17.5 or 17.53 or $\frac{3068}{175}$
	Correct answer scores full marks (unless from obvious incorrect working)	17.531(…….)		A1	At least 5 sf
(b)		17.5	1	B1	ft a number with 2 or more decimal places
					Total 3 marks

14	(side of square =) $\sqrt{49}(=7)$ 7 could also be seen as part of a calculation eg 7 + 7 + 7…..		3	M1	could be on the diagram
	Other side of triangle = $(27-"7")\div 2(=10)$ or 2 sides of triangle = 27 – "7" (= 20) 10 or 20 could also be seen as part of a calculation eg 7 + 7 +…+ 10 + 10 or 7 + 7 + …+ 20			M1	dep on M1 **but we will allow** use of their side of square when assuming 49 is the perimeter eg $\frac{27-12.25}{2}(=7.375)$ or 27 – 12.25 (= 14.75)
	Correct answer scores full marks (unless from obvious incorrect working)	41		A1	
					Total 3 marks

15	enlarge, enlarged	enlargement	3	B1	oe with no mention of reflection, translation, rotation , move, flip, left, up, etc
	SF 3	Scale factor 3		B1	oe allow ×3 or 'three times'
	Origin, O allow $x = 0$, $y = 0$	Centre (0, 0)		B1	oe allow (0, 0) without the word 'centre' but not $\begin{pmatrix}0\\0\end{pmatrix}$
					Total 3 marks

16	$\pi \times 9^2$		2	M1	allow 3.14 or $\frac{22}{7}$ for π
	Correct answer scores full marks (unless from obvious incorrect working)	254		A1	254 – 255
					Total 2 marks

17	$\frac{12}{7}(\times)\frac{35}{16}$		3	M1	for both fractions written as improper fractions
	$\frac{12}{7}\times\frac{35}{16}=\frac{420}{112}$ oe eg $\frac{192}{112}\times\frac{245}{112}=\frac{47040}{12544}$ or $\frac{\cancel{12}^{3}}{7^{1}}\times\frac{\cancel{35}^{5}}{\cancel{16}^{4}}$ oe or eg $\frac{12}{\cancel{7}^{1}}\times\frac{\cancel{35}^{5}}{16}=\frac{60}{16}$ oe			M1	for multiplying the numerators and denominators **or** cancelling the fractions fully **or** partial cancelling and multiplying numerators and denominators
	$\frac{12}{7}\times\frac{35}{16}=\frac{420}{112}=\frac{15}{4}=3\frac{3}{4}$ oe or $\frac{12}{7}\times\frac{35}{16}=\frac{420}{112}=3\frac{84}{112}=3\frac{3}{4}$ oe $\frac{\cancel{12}^{3}}{7^{1}}\times\frac{\cancel{35}^{5}}{\cancel{16}^{4}}=\frac{15}{4}=3\frac{3}{4}$ oe *Working required*	shown		A1	completion to given result. dep on M2 If a student shows clearly in their working that $3\frac{3}{4}=\frac{15}{4}$ they only need to show that the LHS comes to $\frac{15}{4}$
					Total 3 marks

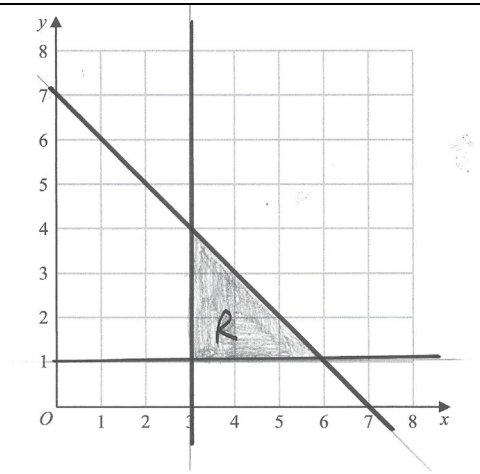
18	(a)		1.45	1	B1 allow $1.44\dot{9}$ or 1.44999(9…)
	(b)		1.35	1	B1 cao SCB1 for (a) 1.35 (b) 1.45 [score B0B1]
					Total 2 marks

19	$\cos 43 = \frac{x}{8.6}$ or $\tan 43 = \frac{8.6\sin 43}{x}$ or $\sin(90-43) = \frac{x}{8.6}$ or $\frac{x}{\sin(90-43)} = \frac{8.6}{\sin 90}$ or $(x^2 =) 8.6^2 - (8.6\sin 43)^2$ or $(x^2 =) 8.6^2 - 5.8(65...)^2$		3	M1	a correct trig statement for x or QR or a correct Pythagoras statement for x^2
	$(x =)\ 8.6\cos 43$ or $(x =)\frac{8.6\sin 43}{\tan 43}\left(=\frac{"5.8(65...)"}{\tan 43}\right)$ or $(x =) 8.6\sin(90-43)$ or $(x =)\frac{8.6\sin 47}{\sin 90}$ or $(x =)\sqrt{8.6^2 - "5.8(65...)"^2}$			M1	a fully correct calculation to find x (some students go straight to this and gain M2)
	Correct answer scores full marks (unless from obvious incorrect working)	6.3		A1	awrt 6.3 seen even if then rounded incorrectly
					Total 3 marks

20	(a)	357 ÷ 0.17 oe or $0.17N = 357$ or $\frac{17}{100} \times N = 357$ oe or $\frac{357 \times 100}{17}$ oe eg 357 × 5.8(82…)		2	M1	a correct calculation for N or a correct equation in N (**not** 17% × N = 357)
		Correct answer scores full marks (unless from obvious incorrect working)	2100		A1	cao
	(b)	806 – 650 (= 156) or $\frac{806}{650}$(=1.24) oe		3	M1	
		$\frac{806 - 650}{650}(\times 100)(= 0.24(\times 100))$ or "1.24" ×100 (= 124) or (1.24 – 1) × 100			M1	a correct calculation for the percentage increase or seeing 124 or 0.24 as either the answer or in part of the working.
		Correct answer scores full marks (unless from obvious incorrect working)	24		A1	cao (SCB1 if no marks scored for an answer of 19.3 – 19.4)
						Total 5 marks

21	$1 - (0.14 + 0.17 + 0.21)$ (= 0.48) or $0.14 + 0.17 + 0.21 + 2x = 1$ oe or 0.14×400 (= 56) or 0.17×400 (= 68) or 0.21×400 (= 84) or $(0.14 + 0.17 + 0.21) \times 400$ (= 208) oe eg 0.52×400 (= 208)		4	M1	Correct use of probabilities total 1 or correct calculation for an estimate for number of times the spinner will land on 2 or on 3 or on 5
	"0.48" ÷ 2 (= 0.24) **[could be seen in table]** or 400 – 56 – 68 – 84 (= 192) oe eg 400 – 208 (= 192) or 0.48×400 (= 192)			M1	A completely correct method to find the probability that the spinner will land on 4 or a completely correct method to find the number of times the spinner will land on 1 or on 4
	"0.24" × 400 oe or 192 ÷ 2			M1	a correct calculation to find the estimate required or an answer leading from 96 seen eg $\frac{96}{400}$
	Correct answer scores full marks (unless from obvious incorrect working)	96		A1	cao SCB1 for 104 if no other marks have been awarded
					Total 4 marks

22	8 × 6 (=48) 0.5 × 8 × 6 (= 24) 15 × 8 (= 120) 15 × 6 (= 90) 15 × 10 (= 150)		3	M1	For a correct method to find the areas of 2 different faces (ie not 2 triangles) allow 8 × 6 as one area (allow if included with incorrect areas for this mark)
	0.5 × 8 × 6 (= 24) (× 2 (= 48)) oe 15 × 8 (= 120) 15 × 6 (= 90) 15 × 10 (= 150) (measurements with intention to add for the 2nd M mark) Surface area = "120" + "90" + "150" + "24" + "24" [allow "120" + "90" + "150" + "48" + "48" (= 456)]			M1	for adding together 4 or 5 values for area, at least 3 of which are from a correct method NB: (6 + 8 + 10) × 15 (= 360) is 3 faces but only award this if clearly not intended to be the volume – eg by the addition of the area of a triangular end.
	Correct answer scores full marks (unless from obvious incorrect working)	408		A1	cao SCB2 for an answer of 456 if no other marks awarded
					Total 3 marks

23	(a)(i) (ii) (iii)	 Line length 2 cm + but shaded area must be enclosed for the mark in (b)		3	B1 $x = 3$ drawn B1 $y = 1$ drawn B1 $x + y = 7$ drawn Allow dashed lines or solid lines for graphs of minimum length 2 squares condone lack of labels if unambiguous
	(b)	**If unlabelled, award:** $x = 3$ and $y = 3$ B1 B0 $y = 1$ and $x = 1$ B0 B1 $x = 3$ and $x = 1$ and $y = 1$ B0 B1 $x = 3$ and $y = 1$ and $y = 3$ B1 B0 $x = 3$ and $x = 1$, $y = 1$ and $y = 3$ B0 B0		1	B1 correct region shaded – shaded in or out – labelled **R** or clear intention to be the required region (ft only for one vertical line (not $x = 0$), one horizontal line (not $y = 0$) and one line with a negative gradient eg $x = 1$, $y = 3$ and $x + y = 7$)
					Total 4 marks

24	4×145 (= 580) or 5×142 (= 710) or $\frac{145+145+145+145+x}{5} = 142$ oe		3	M1	for one correct product or for a correct equation for the weight of the last banana
	$5 \times 142 - 4 \times 145$ or "710" – "580" or $145+145+145+145+x = 5 \times 142$			M1	A fully correct method to find the weight of the 5th banana or a fully correct equation to find the missing weight with no denominator
	Correct answer scores full marks (unless from obvious incorrect working)	130		A1	
					Total 3 marks

25	20 000 × 1.035 (= 20 700) oe or 20 000 × 0.035 (= 700) oe (NB: accept $\left(1+\frac{3.5}{100}\right)$ for 1.035 but not (1 + 3.5%))		3	M1	For finding 103.5% or 3.5% of 20 000	M2 for 20 000 × 1.035^3 [NB: $1.035^3 = 1.108717...$] **or** 20 000 × 1.035^4 (= 22 950…)
	"20 700" × 1.035 (= 21 424.5) "21 424.5"× 1.035 oe eg $20700 \times 0.035 = 724.5$ & $20700 + 724.5 = 21424.5$ $21424.5 \times 0.035 = 749.85...$ & $21424.5 + 749.85...$ (some rounding may have occurred but if the intention is clear, please award)			M1	dep for a complete method	
	Correct answer scores full marks (unless from obvious incorrect working)	22 174		A1	Allow 22174 – 22175 (if you see the correct answer and then 20 000 is subtracted to give 2174 then please award full marks – 2174 with no working gains 2 marks) SCB2 for 2000×1.035^3 (= 2217...) [misread] SCB2 for 22160 (20 000 × 1.108) SCB2 for 22180 (20 000 × 1.109) SCB1 if no marks awarded for any of these are seen (not necessarily the answer) 20 000 × 0.035^n 20 000 × 0.965^3 (= 17 972..……) 20 000 × 0.105 (= 2100) 20 000 × 1.105 ((= 22 100) 20 000 × 1.035^2 (= 21 424.5)	
						Total 3 marks

26	$3x+6+5x+8+7x-9=320$ oe eg $15x + 5 = 320$ Could be implied by $(320 – 5) \div 15$ oe		5	M1	a correct method to find the correct value of x for year 11 students eg an equation
	$(x =)$ 21 or $(3x =)$ 63 *Correct answer of 21 or 63 scores 2 marks (unless from obvious incorrect working)*			A1	For the correct value for x or $3x$
	3 × "their 21" + 6 (= 69) or "their 63" + 6 (= 69) **Look for 69 by the side of the table**			M1ft	dep on M1 a correct method to find the number for year 11 Biology ft their value of x as long as only one value of x is offered and it is a clear intention to be x
	$\frac{126}{360}\times 300 (=105)$ oe eg $\frac{300}{360}(=\frac{5}{6})$ **and** $\frac{5}{6}\times 126 (=105)$ or $\frac{360}{300}=1.2$ **and** 126 ÷ 1.2 (= 105) oe			M1	indep for a correct method to find the number of year 10 whose favourite is Biology $\frac{300}{360}=0.8\dot{3}$ (so allow 0.83)
	dependent on a seeing 21 or 63	36		A1	cao dep on A1 previously scored
					Total 5 marks

27	int angle of pentagon = (3 × 180) ÷ 5 (= 108) oe **or** ext angle of pentagon = 360 ÷ 5 (= 72) oe		5	M1	allow in working but not if labelled in wrong place on diagram (unless clearly started again)
	int angle of hexagon = (4 × 180) ÷ 6 (= 120) **or** ext angle of hexagon = 360 ÷ 6 (= 60)			M1	allow in working but not if labelled in wrong place on diagram (unless clearly started again)
	360 – (“108” + “120”) (= 132) oe **or** “60” + “72” (= 132) **or** $(180-"108")+(180-"120")$ (= 132)			M1	A fully correct method to find the size of angle *AEF* but not if labelled in wrong place on diagram [Figures in inverted commas must come from correct working]
	$[180-("60"+"72")]\div 2$ oe **or** $\frac{180-"132"}{2}$ oe **or** $[180-(180-"108")-(180-"120")]\div 2$ oe			M1	A fully correct method to find the size of angle *EAF* [Figures in inverted commas must come from correct working]
	Correct answer scores full marks (unless from obvious incorrect working)	24		A1	cao
					Total 5 marks

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