Pearson Edexcel

Mark Scheme (Results)

Summer 2025

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

- 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 Mathematics

Values in quotation marks must come from a correct method previously seen unless clearly stated otherwise.

Q	Working	Answer	Mark	Notes
1 (a)		725	1	B1 cao
(b)		32	1	B1 cao
(c) (i)		4578	1	B1 cao
(ii)		8754	1	B1 cao
				Total 4 marks

2 (a)		24	1	B1 cao
(b)	"24" + 32 + 42 + 28 or 15 × 8 + 4 + 2 oe		2	M1 ft their "24", allow one error or omission in adding values
		126		A1 cao
(c)		2 and ¾ circles	1	B1 oe eg 2 and ½ and ¼ circles
				Total 4 marks

3 (a)		6	1	B1 cao
(b)		8	1	B1 cao
(c)		diameter	1	B1 accept chord, condone incorrect spelling
(d)		tangent	1	B1 condone incorrect spelling
				Total 4 marks

4 (a)		20*e*	1	B1 allow *e*20
(b)		15	1	B1 cao
				Total 2 marks

5	(a)		60	1	B1	cao
	(b)		0.19	1	B1	
	(c)	$\frac{16}{20}$ oe eg $\frac{8}{10}$ or answer of $\frac{1}{5}$		2	M1	for a correct unsimplified fraction eg $\frac{16}{20}$ **or** answer of $\frac{1}{5}$ or 0.8 or 80% **or** for any fraction that will cancel written in simplest form eg $\frac{15}{20}=\frac{3}{4}$ or $\frac{4}{16}=\frac{1}{4}$
		Correct answer scores full marks (unless from obvious incorrect working)	$\frac{4}{5}$		A1	cao NOTE: do not ISW eg $\frac{4}{5}$ then answer of 0.8 or 80% is M1A0
						Total 4 marks

6	(a)		23	1	B1	cao
	(b)		Added 4	1	B1	**Acceptable examples** add 4 +4 19 + 4 (= 23) (rule is) 4*n* + 3 goes up by 4 4 × 5 + 3 (= 23) (*n*) + 4 (3*n*) + 4 **Not acceptable examples** 11 – 7 = 4 difference is 4 we subtract the first number and the next number and it gives us the answer
	(c)		51	1	B1	cao
						Total 4 marks

7	$\frac{1}{4}\times 26.8\,(=6.7)$ oe **or** $\frac{3}{4}\times 26.8\,(=20.1)$ oe **or** 2 × 26.8 (= 53.6)		4	M1	for method to find the discount off one calculator **or** the reduced price of one calculator **or** the cost of two calculators
	"6.7" × 3 × 2 (= 40.2) oe eg (26.8 – "6.7") × 2 (= 40.2) **or** "20.1" × 2 (= 40.2) **or** $"53.6"-\frac{1}{4}\times"53.6"\left(=40.2\right)$ oe **or** $\frac{3}{4}\times"53.6"\left(=40.2\right)$ oe			M1	for method to find the reduced price of two calculators
	50 – "40.2"			M1	for a complete method
	Correct answer scores full marks (unless from obvious incorrect working)	9.8(0)		A1	SCB2 for an answer of 29.9(0) **or** 36.6(0) SCB1 for an answer of 23.2(0) **or** ±3.1(0)
					Total 4 marks

8	(a)		–5, –3, (–1), 1, 3, (5)	2	B2 (B1	for all correct values in the table for 2 or 3 correct values)
	(b)			2	M1ft	for at least 5 points plotted correctly (within the circles on the overlay) ft their incorrect table (provided B1 scored in part (a)) **or** for correct line segment through at least 3 of (−2, −5) (−1, −3) (0, −1) (1, 1) (2, 3) (3, 5) **or** for a straight line with gradient 2 **or** for a straight line through (0, –1) with a positive gradient
		Correct answer scores full marks (unless from obvious incorrect working)	Correct line drawn		A1	for a correct line between $x = –2$ and $x = 3$ (clear intention to go through all the points and which must be a line – allow freehand) Ignore to the left of $x = –2$ and to the right of $x = 3$ (**Note**: If a fully correct graph is shown, but a blank table is shown in (a), then award 2 marks for (a) and 2 marks for (b))
						Total 4 marks

9 (a)	eg $72 \div 6$ (= 12) **or** $132 \div 72 \left(= \frac{11}{6}\right)$ **or** $48 \div 72 \left(= \frac{2}{3}\right)$ **or** 360 – (48 + 72 + 132) (= 108)		3	M1	for a correct first step **or** for one correct value Values may be seen on the pie chart
	eg (freq boiled =) $132 \div$ "12" (= 11) **or** $6 \times "\frac{11}{6}" (= 11)$ **OR** (freq poached =) "108" ÷ "12" (= 9) **OR** (angle poached =) "9" × "12" (= 108) **or** 360 – (48 + 72 + 132) (= 108) **OR** (freq fried =) 48 ÷ "12" (= 4) **or** $6 \times "\frac{2}{3}" (= 4)$			M1	for method to work out 3 of the values
	Correct answer scores full marks (unless from obvious incorrect working)	11, 9, 4, 108		A1	cao
(b)		$\frac{72}{360}$	1	B1ft	oe eg $\frac{1}{5}$, $\frac{6}{30}$, 20%, 0.2 allow $\frac{6}{\text{their total frequency}}$ their total is dep on a complete frequency column in the table
					Total 4 marks

10	eg $80 \times 12 \times 42$ (= 40 320) **or** $16 \times 4 \times 6$ (= 384)	eg $42 \div 6$ (= 7) **or** $12 \div 4$ (= 3) **or** $80 \div 16$ (= 5) **or** $\frac{80 \times 12}{16 \times 4} (= 15)$ **or** $\frac{80 \times 42}{16 \times 6} (= 35)$ **or** $\frac{42 \times 12}{6 \times 4} (= 21)$		3	M1	for method to find the volume of the crate or the box **or** method to find the number of boxes along one dimension of the crate **or** for dividing the areas of corresponding faces
	"40 320" ÷ "384"	eg "7" × "3" × "5" **or** "15" × "7" **or** "35" × "3" **or** "21" × "5"			M1	for a complete method to find the number of boxes
	Correct answer scores full marks (unless from obvious incorrect working)		105		A1	cao
						Total 3 marks

11	eg (1 box =) $708 \div 12$ (= 59) **or** (2 boxes =) $708 \div 6$ (= 118) **or** (3 boxes =) $708 \div 4$ (= 177) **or** (4 boxes =) $708 \div 3$ (= 236) **or** (6 boxes =) $708 \div 2$ (= 354) **or** $12 \div 5$ (= 2.4) **or** $708 \div \frac{12}{5}$ oe eg $708 \div 2.4$ **or** $708 \times \frac{5}{12}$ **or** 708×5 (3540)		2	M1	for starting to work with proportion
	Correct answer scores full marks (unless from obvious incorrect working)	295		A1	cao
					Total 2 marks

12	(a)		3 (hours) 25 (minutes)	2	B2 (B1	for 3 (hours) **and** 25 (minutes) for 3 (hours) **or** 25 (minutes))
	(b)	48 ÷ 120 (= 0.4) **or** 48 ÷ 120 × 100 oe **or** $\frac{48}{120}$ oe eg $\frac{2}{5}$ **or** $\frac{48}{120}\times 100$ oe **or** (120 – 48) ÷ 120 × 100 (= 60) oe		2	M1	for a correct first step
		Correct answer scores full marks (unless from obvious incorrect working)	40		A1	cao
						Total 4 marks

13	eg $\frac{12}{28}$ and $\frac{7}{28}$ **or** $\frac{12n}{28n}$ and $\frac{7n}{28n}$ **or** 4 × 3 (= 12) **and** (1 ×) 7 **and** 4 × 7 (= 28) **or** $\frac{3\times 4}{4\times 7}$ and $\frac{(1\times)7}{4\times 7}$		2	M1	for finding a common denominator with at least one fraction correct **or** for calculations that would lead to 12 **and** 7 **and** 28
	$\frac{12}{28}+\frac{7}{28}=\frac{19}{28}$ **or** $\frac{12n}{28n}+\frac{7n}{28n}=\frac{19n}{28n}=\frac{19}{28}$ **or** 12 + 7 = 19 **and** $\frac{19}{28}$ **or** 4 × 3 + (1 ×) 7 (= 19) **and** 4 × 7 (= 28) **and** $\frac{19}{28}$ **or** $\frac{3\times 4+(1\times)7}{4\times 7}=\frac{19}{28}$ **or** $\frac{3\times 4}{4\times 7}+\frac{(1\times)7}{4\times 7}=\frac{19}{28}$ *Working required*	Shown		A1	dep on M1, for a complete correct method leading to $\frac{19}{28}$
					Total 2 marks

14	(a)		$x^2 - 7x$	1	B1	allow $-7x + x^2$
	(b)		$2(4y - 5)$	1	B1	allow $2(-5 + 4y)$
	(c)	eg $48 = 5a + 7 \times 3$ oe **or** $48 = 5a + 21$ oe **or** $(5a =)\ 48 - 7 \times 3\ (= 27)$ oe **or** $(5a =)\ 48 - 21\ (= 27)$ oe **or** $a = \frac{m - 7b}{5}$		3	M1	for substituting into the equation **or** making a the subject of the equation
		$(a =)\frac{48 - 7 \times 3}{5}$ oe **or** $(a =)\frac{48 - 21}{5}$			M1	for a complete method
		Correct answer scores full marks (unless from obvious incorrect working)	5.4		A1	oe eg $\frac{27}{5}$ SCB1 for answer of 261
						Total 5 marks

15	eg 40 ÷ 5 (= 8) **or** 40 × 8.5 (= 340)		4	M1	for starting to work with the ratio **or** working out the total income from the chocolate cakes
	eg 7 × "8" (= 56)			M1	for method to find the number of lemon cakes
	eg "340" + "56" × 12.75 **or** "340" + 714			M1	for a complete method
	Correct answer scores full marks (unless from obvious incorrect working)	1054		A1	cao If no other marks awarded, award SCB2 for answer of 439(.166….) SCB1 for 141(.66…) or 297(.5(0))
					Total 4 marks

16	(a)		17	1	B1	cao
	(b)			2	M1	for $\frac{6}{m}$ where $m > 6$ **or** $\frac{n}{25}$ where $n < 25$ **or** answer of 6 : 25 **or** 6 out of 25
		Correct answer scores full marks (unless from obvious incorrect working)	$\frac{6}{25}$		A1	oe eg 0.24, 24%
						Total 3 marks

17	eg 6×8 (= 48) **or** $\frac{1}{2} \times 6 \times 3 (= 9)$ **or** $\frac{1}{2} \times \frac{6}{2} \times 3 (= 4.5)$ **or** $\frac{1}{2} \times (11 + 8) \times 3 (= 28.5)$			4	M1 for a correct method to find one relevant area
	eg "48" + "9" (= 57) **or** "48" + "4.5" + "4.5" (= 57) **or** "28.5" × 2 (= 57)	**or** eg "48" ÷ 4 (= 12) **or** "9" ÷ 4 (= 2.25 or 3) **or** "4.5" ÷ 4 (= 1.125) **or** "28.5" ÷ 4 (= 7.125)			M1 **from this mark onwards follow either left hand column or right hand column** **left hand column** for a complete method to find the total area **or** **right hand column** a correct method to find the number of tins of paint for part of the stage
	eg "57" ÷ 4 (= 14.25) **or** their area ÷ 4 eg total area = 66 **and** 66 ÷ 4 (= 16.5) **or** 15 × 4 (= 60) **or** using multiples of 4 for their area eg total area = 66 **and** 17 × 4 (= 68)	eg "12" + "2.25"(= 14.25) **or** "12" + "1.125" + "1.125" (= 14.25) **or** 2 × "7.125" (= 14.25)			M1 **left hand column** (indep) for a method to find the number of tins for their area ft from any value that has come from a calculation that includes at least 2 of the given dimensions **or** **right hand column** method to find the total number of tins of paint by adding number of tins from the parts of the stage
	Working required		15		A1 dep on M2, must be from correct working
					Total 4 marks

18	(a)		$5 < d \leq 10$	1	B1	allow 5 – 10 or 5 to 10 or $5 < d < 10$ or $5 \leq d \leq 10$ or $5 \leq d < 10$
	(b)	$2.5 \times 26 + 7.5 \times 40 + 12.5 \times 16 + 17.5 \times 10 + 22.5 \times 8$ (= 920) or 65 + 300 + 200 + 175 + 180 (= 920) [lower bound products are: 0, 200, 160, 150, 160] [sum of lower bound products is: 670] [products using 3, 8, 13, 18, 23 are: 78, 320, 208, 180, 184] [sum of products using 3, 8, 13, 18, 23 is: 970] [upper bound products are: 130, 400, 240, 200, 200] [sum of upper bound products is: 1170]		4	M2	for at least **4** correct products added (need not be evaluated ie can be in the form $2.5 \times 26 + 7.5 \times 40 + \ldots$) If not M2 then award: M1 for consistent use of values within interval (including end points) for at least **4** products added (need not be evaluated ie can be in the form $5 \times 26 + 10 \times 40 + \ldots$) or correct midpoints used for at least **4** products and not added
		"920" ÷ "100"			M1	(dep on at least M1) Allow division by their Σf provided addition or total under column seen
		Correct answer scores full marks (unless from obvious incorrect working)	9.2		A1	oe eg $9\frac{1}{5}$ or $\frac{46}{5}$ SCB2 for answer of 6.7 or 9.7 or 11.7
						Total 5 marks

19	(a)	$4 \times 6 \times 80$ (= 1920)	4×6 (= 24) **or** $2160 \div 80$ (= 27)	$2160 \div (80 \times 4)$ (= 6.75)		4	M1 for method to work out total income **or** income from one box **or** expenditure for one box **or** income per cup
		$2160 - \text{“1920”}$ (= 240) **or** $\frac{2160}{\text{"1920"}}\left(=1.125\right)$	$\text{“27”} - \text{“24”}$ (= 3) **or** $\frac{\text{"27"}}{\text{"24"}}\left(=1.125\right)$	$\text{“6.75”} - 6$ (= 0.75) **or** $\frac{\text{"6.75"}}{6}\left(=1.125\right)$			M1 for working out the profit **or** income ÷ expenditure
		$\frac{\text{"240"}}{\text{"1920"}}(\times 100)$ **or** $0.125 (\times 100)$ **or** $\left(\frac{2160}{\text{"1920"}}-1\right)(\times 100)$ **or** (“1.125” – 1) (× 100) **or** “1.125” × 100 (= 112.5)	$\frac{\text{"3"}}{\text{"24"}}(\times 100)$ **or** $0.125 (\times 100)$ **or** $\left(\frac{\text{"27"}}{\text{"24"}}-1\right)(\times 100)$ **or** (“1.125” – 1) (× 100) **or** “1.125” × 100 (= 112.5)	$\frac{\text{"0.75"}}{6}(\times 100)$ **or** $0.125 (\times 100)$ **or** $\left(\frac{\text{"6.75"}}{6}-1\right)(\times 100)$ **or** (“1.125” – 1) (× 100) **or** “1.125” × 100 (= 112.5)			M1 for a method to reach one step from the answer ie getting to $\frac{1}{8}$ oe or 0.125 or 112.5
		Working required			12.5		A1 dep on M1
	(b)				8.5	1	B1 cao
	(c)				125	1	B1 allow $124.\dot{9}$ or 124.99…
							Total 6 marks

20	eg 360 – (148 + 50) (= 162) **or** 180 – 50 (= 130) **or** 180 – 148 (= 32)			4	M1 for method to find the interior angle of the polygon **or** start to the method of finding the exterior angle of the polygon
	eg 180 – "162" (= 18) **or** 148 – "130" (= 18) **or** 50 – "32" (= 18)	eg 180(n – 2) = "162"n **or** 180(n – 2) ÷ n = "162"			M1 for method to find the exterior angle **or** for setting up an equation using sum of interior angles formula
	eg 360 ÷ "18"	eg (n =) 360 ÷ (180 − "162")			M1 for a complete method
	Working required		20		A1 dep on M1
					Total 4 marks

21	(a)		12	1	B1	accept x^{12}
	(b)		5	1	B1	accept y^5
	(c)		$125a^{12}r^6$	2	B2	for $125a^{12}r^6$ (B1 for a product in the form ka^pr^q where 2 from k, p or q are correct eg $5a^{12}r^6$ Allow $125a^{12}$ or $125r^6$ or $a^{12}r^6$ so as long as not added to any other terms)
						Total 4 marks

22	eg $1 - 0.28$ (= 0.72) oe **or** $0.72x = 198$ **or** 100(%) − 28(%) (= 72(%)) **or** $\frac{198}{72}$ (= 2.75) oe		3	M1 for a correct first step
	eg (x =) 198 ÷ "0.72" oe **or** 198 ÷ "72" × 100 oe **or** "2.75" × 100			M1 for a complete method
	Correct answer scores full marks (unless from obvious incorrect working)	275		A1 cao
				Total 3 marks

23 (a)	$6x - 24 = 3 + 2x$ **or** $x - 4 = \frac{3}{6} + \frac{2}{6}x$ oe		3	M1	for correct removal of fraction and expansion of bracket in a correct equation **or** separating fraction (RHS) in an equation
	$6x - 2x = 3 + 24$ **or** $4x = 27$ **or** $-24 - 3 = 2x - 6x$ **or** $-27 = -4x$ oe **or** $x - \frac{2}{6}x = \frac{3}{6} + 4$ oe **or** $-4 - \frac{3}{6} = \frac{2}{6}x - x$ oe			M1ft	(dep on 4 terms) correctly rearranging their 4 term equation for terms in x on one side of equation and number terms on the other
	Working required	$\frac{27}{4}$		A1	oe eg 6.75 or $6\frac{3}{4}$, dep on M1
(b)(i)	$(y \pm 6)(y \pm 5)$ **or** $(6 \pm y)(5 \pm y)$ **or** $y(y - 6) - 5(y - 6)$ **or** $y(y - 5) - 6(y - 5)$		2	M1	for $(y \pm 6)(y \pm 5)$ **or** $(6 \pm y)(5 \pm y)$ **or** for $(y + a)(y + b)$ where $ab = 30$ or $a + b = -11$ **or** $y(y + a) + b(y + a)$ or $y(y + b) + a(y + b)$ where $ab = 30$ or $a + b = -11$
	Correct answer scores full marks (unless from obvious incorrect working)	$(y - 6)(y - 5)$		A1	oe, allow any letter for y
(ii)		$(y =) 6, (y =) 5$	1	B1	must ft from their answer in (b)(i) ft from their factors in the form $(y + a)(y + b)$
					Total 6 marks

24	$3892 = \pi \times 8^2 \times h$ **or** $\pi \times 8^2 \left(= 64\pi = 201...\right)$		3	M1 allow use of 3.14… or $\frac{22}{7}$ for π
	$\left(h =\right)\frac{3892}{\pi \times 8^2}$ oe eg 3892 ÷ 64 = 60.8… **and** 60.8… ÷ π			M1 allow use of 3.14… or $\frac{22}{7}$ for π
	Correct answer scores full marks (unless from obvious incorrect working)	19.4		A1 allow 19.3 – 19.4
				Total 3 marks

25	(a)		5.2×10^8	1	B1
	(b)		0.000 087 9	1	B1
	(c)	35×10^{-138} **or** $3.5 \times 10 \times 10^{-138}$ **or** 3.5×10^n where $n \neq -137$		2	M1
		Correct answer scores full marks (unless from obvious incorrect working)	3.5×10^{-137}		A1
					Total 4 marks

26	eg $12\sin 60\left(=6\sqrt{3}=10.3(9...)\right)$ **or** $\sqrt{12^2-"6"^2}\left(=6\sqrt{3}=10.3(9...)\right)$ **or** (Area *ADC* =) $\frac{1}{2}\times 12\times 47\times\sin 60 (=244.2...)$		5	M1	for a method find the height of the trapezium **or** the area of triangle *ADC* The first two M1 marks can be awarded in either order
	eg $12\cos 60\left(=6\right)$ **or** $\sqrt{12^2-\left("6\sqrt{3}"\right)^2}\left(=6\right)$			M1	(indep) for a method find the base of the triangle, condone missing brackets around $"6\sqrt{3}"$ The first two M1 marks can be awarded in either order
	eg (*AB* =) 47 – "6" – "6" (= 35)			M1	(dep on previous M1) for method to find the length of *AB*
	eg (Trapezium =) $\frac{1}{2}\times\left(47+"35"\right)\times"10.3(9...)"$ **or** (Rectangle + 2 × Triangle =) $"35"\times"10.3(9...)"+2\times\frac{1}{2}\times"6"\times"10.3(9...)"$ **or** (Rectangle + 2 × Triangle =) $"35"\times"10.3(9...)"+2\times\frac{1}{2}\times"6"\times 12\times\sin 60$ **or** (Triangle *ADC* + Triangle *ABC* =) $"244.2..."+\frac{1}{2}\times 12\times"35"\times\sin 120$ oe eg $\left(47-"6"\right)\times"10.3(9...)"$			M1	for a complete method There are other methods and marks should be awarded for a complete method that should give the correct area
	Working required	426		A1	(dep on M1) allow 420 – 427 from correct working
					Total 5 marks

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