



# Mark Scheme (Results)

January 2021

Pearson Edexcel International GCSE  
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.
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- **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

<b>International GCSE Maths</b>				
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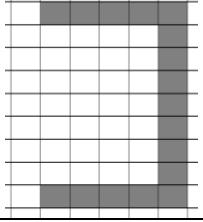
**Apart from questions 16, 21b, 25bii (where the mark scheme states otherwise) the correct answer, unless clearly obtained by an incorrect method, should be taken to imply a correct method**

<b>Q</b>	<b>Working</b>	<b>Answer</b>	<b>Mark</b>	<b>Notes</b>
<b>1 (a)</b>		Ojos del Salado	1	B1
(b)		8 tens	1	B1 accept 80, tens
(c)		Six thousand and forty six	1	B1 cao
(d)		5100	1	B1 cao
(e)		2370	1	B1 accept -2370
				<b>Total 5 marks</b>

<b>2 (a)(i)</b>		Three different numbers less than or equal to 9	1	B1 cao e.g. 1, 2, 3 or 3, 6, 9
(a)(ii)		Three different multiples of ten	1	B1 cao e.g. 10, 20, 30 or 20, 40, 60
(b)		A cross at 0.5	1	B1 cao
				<b>Total 3 marks</b>

<b>3</b>	$(36 - 25) \times 7.45$ oe		3	M2 for a complete method (M1 for $36 - 25 (= 11)$ or for $W \times 7.45$ where $W$ is their weight)
		81.95		A1
				<b>Total 3 marks</b>

<b>4</b>	(a)		$\frac{57}{100}$	1	B1	cao
	(b)		2	1	B1	cao
	(c)		$\frac{6}{7}$	1	B1	cao
	(d)		$4\frac{2}{5}$	1	B1	cao
	(e)		78	1	B1	cao
						<b>Total 5 marks</b>

<b>5</b>	(a)		Correct shape	1	B1	cao
	(b)		17, 21	1	B1	cao
	(c)		33	1	B1	cao
	(d)		The numbers of shaded squares are odd numbers	1	B1	Accept e.g. 50 is an even number <b>or</b> the sequence is all odd numbers <b>or</b> 49 is in the sequence so 50 can't be as it's only one more <b>or</b> 53 is the next number after 49 <b>or</b> 49 and 53 are in the sequence (so not 50) <b>or</b> nth term is $4n + 1$ and for 50 $n = 12.25$ / not an integer
						<b>Total 4 marks</b>

<b>6</b>	$6 \times 100 (= 600)$ <b>or</b> $17.5 \div 100 (= 0.175)$		3	B1	
	$“600” \div 17.5 (= 34.28\dots)$ <b>or</b> $6 \div “0.175” (= 34.28\dots)$			M1	ft incorrect conversion
		34		A1	cao
					<b>Total 3 marks</b>

<b>7</b>	(a)		$13x - 2y$	2	B2 (B1) accept $-2y + 13x$ for $13x$ or $-2y$ )
	(b)	$2n = 16 - 5$ or $2n = 11$ oe or $(16 - 5) \div 2$		2	M1 for a correct first step <b>or</b> a correct calculation for $n$
			5.5		A1 for 5.5 or $\frac{11}{2}$ or $5\frac{1}{2}$
					<b>Total 4 marks</b>

<b>8</b>	(a)		ramen	soba	udon	Total	Correct table	3	B3 (B2 4 or 5 correct entries B1 2 or 3 correct entries)
		Boiled	18	5	8	31			
		Fried	10	12	7	29			
		Total	28	17	15	60			
	(b)					$\frac{7}{60}$	1	B1 accept 0.11666... (accept 2 d.p. or better truncated or rounded) or 11.666...% (accept 2 s.f. or better truncated or rounded)	<b>Total 4 marks</b>

<b>9</b>	$360 - (59 + 115 + 68) (= 118)$		4	M1 angle values may be seen on diagram throughout
		$x = 62$		A1 from correct working
	<u>Angles</u> in a <u>quadrilateral</u> add up to 360. Accept “4-sided shape” <u>Angles</u> on a straight <u>line</u> add to $180^\circ$ Base angles in an <u>isosceles</u> triangle (are equal)		B2 (dep on M1) for all correct reasons for their method  (B1 (dep on M1) for 1 correct reason for their method)	
				<b>Total 4 marks</b>

<b>10</b>	$5.75 \div 5 (= 1.15)$		3	M1 for finding the cost of one chocolate bar
	$e.g. (7.85 - 2 \times "1.15") \div 3$			M1 (dep on M1) for a complete method to find the cost of one packet of sweets
		1.85		A1 cao
				<b>Total 3 marks</b>

<b>11</b>		11 hours and 45 minutes	2	B2 for 11 hours and 45 minutes (B1 for 11 hours or 45 minutes)
				<b>Total 2 marks</b>

<b>12</b>	(a)		$4x - x^2$	1	B1
	(b)	e.g. $1.5 \times 2.4 - (-5.6)$ or $1.5 \times 2.4 + 5.6$ or $3.6 + 5.6$ oe		2	M1 for a correct substitution
			9.2		A1 accept $\frac{46}{5}$ or $9\frac{1}{5}$
	(c)	$y + e = dx$ oe or $\frac{y}{x} = d - \frac{e}{x}$		2	M1 for a correct first step
			$d = \frac{y + e}{x}$		A1 oe e.g. $d = \frac{y}{x} + \frac{e}{x}$
					<b>Total 5 marks</b>

<b>13</b>	(a)	e.g. $\frac{180}{750} \times 100$ oe or $0.24 \times 100$		2	M1 for a complete method
			24		A1
	(b)	e.g. $32.50 \times 180 (= 5850)$ or e.g. $0.94 \times 32.50$ oe ( $= 30.55$ )		3	M1 for finding the total income or 94% of the cost of one ticket
		e.g. $0.94 \times "5850"$ oe or “5850” – $0.06 \times "5850"$ oe or $180 \times "30.55"$			M1 for a complete method
			5499		A1
					<b>Total 5 marks</b>

<b>14</b>	(a)	Reflection $x = 1$	2	B1	for reflection with no mention of translate, rotate, enlarge, move
				B1	for $x = 1$ with no mention of a vector, angle or scale factor
(b)		Rotation about (0,0) 90° clockwise	3	B1	for rotation with no mention of translate, reflect, enlarge, move
				B1	for 90° clockwise/270° anticlockwise/-90° with no mention of a vector, line of symmetry or scale factor
				B1	for (centre =) (0,0), accept origin or $O$ with no mention of a vector, line of symmetry or scale factor Do not accept $\begin{pmatrix} 0 \\ 0 \end{pmatrix}$ for centre
					<b>Total 5 marks</b>

<b>15</b>	(a)		$\frac{13}{30}$	1	B1	accept 0.43(333...) or 43(.333...)%
(b)		e.g. $1 - \frac{7}{30}$ or $\frac{13+4+6}{30}$ or $\frac{23}{a}$ where $a > 23$ and $a \neq 30$		2	M1	
			$\frac{23}{30}$		A1	accept 0.76(666...) or 0.77 or 76(.666...)% or 77%
						penalise incorrect notation once only
						<b>Total 3 marks</b>

<b>16</b>	e.g. $\frac{20}{24}$ and $\frac{9}{24}$ or $\frac{40}{48}$ and $\frac{18}{48}$ or $\frac{20n}{24n}$ and $\frac{9n}{24n}$		2	M1 for finding a common denominator with at least one fraction correct
	$\frac{20}{24} - \frac{9}{24} = \frac{11}{24}$ $\frac{40}{48} - \frac{18}{48} = \frac{22}{48} = \frac{11}{24}$ $\frac{20n}{24n} - \frac{9n}{24n} = \frac{11n}{24n} = \frac{11}{24}$	Shown		A1 dep on M1, for a complete correct method leading to $\frac{11}{24}$
	<b>Total 2 marks</b>			

<b>17</b>	e.g. $0.7 \times 20160$ oe (= 14112)  or $0.3 \times 20160$ oe (= 6048)		4	M1
	e.g. “14112” $\div$ (9 + 5 + 2) (= 882)  or $(20160 - “6048”) \div (9 + 5 + 2)$ (= 882)		M1	M2 for $\frac{9-2}{9+5+2} \times “14112”$ oe
	e.g. $9 \times “882” - 2 \times “882”$		M1	
		6174		A1
				<b>Total 4 marks</b>

<b>18</b>	(a)		$70 < s \leq 80$	1	B1
	(b)	$10 \times 45 + 16 \times 55 + 19 \times 65 + 23 \times 75 + 12 \times 85$ <b>or</b> $450 + 880 + 1235 + 1725 + 1020 (= 5310)$		4	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  <b>or</b>  for at least 4 correct products with correct mid-interval values with no intention to add
		$"5310" \div 80$		M1	dep on at least M1 allow division by their $\sum f$ provided addition or total under column seen
		66.4		A1	accept $66.37 - 66.4$
					<b>Total 5 marks</b>

<b>19</b>	e.g. $30 \times 20 \times 125 (= 75\ 000)$ <b>or</b> $85 \times 40 \times 125 (= 425\ 000)$ <b>or</b> $(60 \times 30 + (85 - 30) \times 40) \times 125 (= 500\ 000)$ oe		4	M1	for a method to find the volume of water already pumped out <b>or</b> the volume of water left <b>or</b> the total volume of the container
	“75 000” $\div$ 1.5 (= 50 000) <b>or</b> “75 000” $\div$ 90 (= 833.3... or $\frac{2500}{3}$ ) <b>or</b> “425000” $\div$ “75000” (= 5.66... or $\frac{17}{3}$ ) <b>or</b> “500000” $\div$ “75000” (= 6.66... or $\frac{20}{3}$ )			M1	M2 for $\frac{“425000”}{“75000”} \times 1.5$ oe (= 8.5) <b>or</b> $\frac{“500000”}{“75000”} \times 1.5$ oe (= 10)
	“425 000” $\div$ “50 000” (= 8.5) <b>or</b> “425 000” $\div$ (“833.3...” $\times$ 60) oe (= 8.5) <b>or</b> “5.66...” $\times$ 1.5 (= 8.5) <b>or</b> “6.66...” $\times$ 1.5 (= 10)			M1	
		20 30		A1	Allow 8 30 (pm)
					<b>Total 4 marks</b>

<b>20</b>	(i)		21, 27	1	B1
	(ii)		21, 23, 24, 25, 27, 29	1	B1
					<b>Total 2 marks</b>

<b>21</b>	(a)	$5y^3(3y + 4u)$	2	B2 for $5y^3(3y + 4u)$  (B1 for $5y(3y^3 + 4uy^2)$ <b>or</b> $5y^2(3y^2 + 4uy)$ <b>or</b> $y^2(15y^2 + 20uy)$ <b>or</b> $y^3(15y + 20u)$ <b>or</b> $5y^3(\dots)$ where there is only one mistake in the brackets)
	(b)	$4 \times (4 - 3x) = 5 - 8x$ oe <b>or</b> $16 - 12x = 5 - 8x$ oe <b>or</b> $4 - 3x = \frac{5}{4} - 2x$ oe	3	M1 for removal of fraction in a correct equation
		e.g. $16 - 5 = 12x - 8x$ <b>or</b> $11 = 4x$ oe <b>or</b> $4 - \frac{5}{4} = 3x - 2x$		M1 for terms in $x$ on one side <b>and</b> numbers on the other side in an equation, allow correct rearrangement of their equation in the form $ax + b = cx + d$
		2.75		A1 (dep on M1) oe e.g. $2\frac{3}{4}$ or $\frac{11}{4}$
				<b>Total 5 marks</b>

<b>22</b>	(a)	$2.84 \times 10^9$	1	B1
	(b)	0.000 25	1	B1
				<b>Total 2 marks</b>

<b>23</b>	(a)	for $0.035 \times 40\ 000$ oe (= 1400) <b>or</b> $1.035 \times 40\ 000$ oe (= 41 400)	<b>OR</b>  40 000 × 1.035 <sup>3</sup>		3	M1 for finding 3.5% <b>or</b> 103.5% of 40 000	<b>OR</b> M2 for $40\ 000 \times$ 1.035 <sup>3</sup> <b>or</b> $40\ 000 \times 1.035^4$ (= 45 900.92)  (M1 for $40\ 000 \times$ 1.035 <sup>2</sup> (= 42 849))		
		1.035 × “41 400” oe (= 42 849) 1.035 × “42 849” oe (= 44 348.72)				M1 for completing method to find total amount in the account			
				44 349	A1	accept $44\ 348 - 44\ 349$			
						SC: if no other marks gained award M1 for $0.105 \times 40\ 000$ oe <b>or</b> 4200 <b>or</b> 44 200  accept (1 + 0.035) as equivalent to 1.035 throughout			
	(b)	e.g. $30\ 481 \div (1 - 0.065)$ <b>or</b> $30\ 481 \div 0.935$		3	M2 for a complete method  (M1) for $30\ 481 \div (100 - 6.5)$ (= 326) <b>or</b> $(100 - 6.5)\% = 30\ 481$ <b>or</b> 93.5% = 30 481 <b>or</b> e.g. $(1 - 0.065)x = 30\ 481$				
				32 600	A1				
						<b>Total 6 marks</b>			

<b>24</b>	$2 \times \pi \times 7 (= 43.982\dots \text{ or } 14\pi)$ <b>or</b> $(2 \times \pi \times 7) \div 2 (= 21.991\dots \text{ or } 7\pi)$ <b>or</b> $2 \times \pi \times 9 (= 56.548\dots \text{ or } 18\pi)$ <b>or</b> $(2 \times \pi \times 9) \div 2 (= 28.274\dots \text{ or } 9\pi)$		3	M1 for finding the circumference of either the full circle or the length of the arc for either semicircle
	e.g. “21.991” + “28.274” (= 50.26...) <b>or</b> “ $7\pi$ ” + “ $9\pi$ ” (=16 $\pi$ ) <b>or</b> “21.991” + “28.274” + 2 (= 52.26...) <b>or</b> “ $7\pi$ ” + “ $9\pi$ ” + 2 (= 52.26...) <b>or</b> “21.991” + “28.274” + 2 + 2 <b>or</b> “ $7\pi$ ” + “ $9\pi$ ” + 2 + 2			M1 for a method to find the length of the two arcs with intention to add
		54.3		A1 accept 54.2 – 54.3
				<b>Total 3 marks</b>

<b>25 (a)</b>		$16x^{12}y^{20}$	2	B2 B1 for an answer in the form $ax^ny^m$ with 2 correct from $a = 16, n = 12, m = 20$
(b)(i)	$(x \pm 9)(x \pm 4)$		2	M1 for $(x \pm 9)(x \pm 4)$ <b>or</b> for $(x + a)(x + b)$ where $ab = -36$ or $a + b = 5$
		$(x + 9)(x - 4)$		A1
(ii)		-9, 4	1	B1 ft from (b)(i)
				<b>Total 5 marks</b>

<b>26</b>	<p>e.g. <math>\sin 65 = \frac{16}{AB}</math> or <math>\cos 25 = \frac{16}{AB}</math>  <b>or</b> <math>\frac{AB}{\sin 90} = \frac{16}{\sin 65}</math> or <math>\tan 65 = \frac{16}{AD}</math>  <b>or</b> <math>\tan 25 = \frac{AD}{16}</math> or <math>\frac{AD}{\sin 25} = \frac{16}{\sin 65}</math></p>	4	<p>M1 for a correct trig ratio for <math>AB</math> or <math>AD</math>  accept <math>180 - 90 - 65</math> for 25</p>
	<p>e.g. <math>(AB =) \frac{16}{\sin 65} (= 17.654\dots)</math>  <b>or</b> <math>(AB =) \frac{16}{\cos 25} (= 17.654\dots)</math>  <b>or</b> <math>(AB =) \frac{16 \sin 90}{\sin 65} (= 17.654\dots)</math>  <b>and</b>  <math>(AD =) \frac{16}{\tan 65} (= 7.460\dots)</math>  <b>or</b> <math>(AD) = 16 \times \tan 25 (= 7.460\dots)</math>  <b>or</b> <math>(AD =) \frac{16 \sin 25}{\sin 65} (= 7.460\dots)</math></p>		<p>M1 for finding <math>AB</math> and <math>AD</math>  Allow use of Pythagoras  <math>(AD =) \sqrt{17.654\dots^2 - 16^2} (= 7.460\dots)</math>  or  <math>(AB =) \sqrt{7.460\dots^2 + 16^2} (= 17.654\dots)</math></p>
	$(“17.654\dots” \times 2) + (“7.460\dots” \times 2)$ oe	50.2	<p>M1 for a complete method to find the perimeter</p>
			<p>A1 accept <math>49.6 - 50.6</math></p>
			<b>Total 4 marks</b>