Mark Scheme (Results)

November 2018

Pearson Edexcel GCSE (9 – 1)
In Mathematics (1MA1)
Foundation (Calculator) Paper 2F

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General marking guidance

These notes offer general guidance, but the specific notes for examiners appertaining to individual questions take precedence.

1 All candidates must receive the same treatment. Examiners must mark the last candidate in exactly the same way as they mark the first.

Where some judgement is required, mark schemes will provide the principles by which marks will be awarded; exemplification/indicative content will not be exhaustive. When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the response should be sent to review.

2 All the marks on the mark scheme are designed to be awarded; mark schemes should be applied positively. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme. If there is a wrong answer (or no 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.

Questions where working is not required: In general, the correct answer should be given full marks.
Questions that specifically require working: In general, candidates who do not show working on this type of question will get no marks – full details will be given in the mark scheme for each individual question.

3 Crossed out work
This should be marked **unless** the candidate has replaced it with an alternative response.

4 Choice of method
If there is a choice of methods shown, mark the method that leads to the answer given on the answer line.

If no answer appears on the answer line, mark both methods **then award the lower number of marks.**

5 Incorrect method
If it is clear from the working that the "correct" answer has been obtained from incorrect working, award 0 marks. Send the response to review for your Team Leader to check.

6 Follow through marks
Follow through marks which involve a single stage calculation can be awarded without working as you can check the answer, but if ambiguous do not award.
Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

7 **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 or its context. (eg. an incorrectly cancelled fraction when the unsimplified fraction would gain full marks).
It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect (eg. incorrect algebraic simplification).

8 **Probability**
Probability answers must be given as a fraction, percentage or decimal. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).
Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.
If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

9 **Linear equations**
Unless indicated otherwise in the mark scheme, full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously identified in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded (embedded answers).

10 **Range of answers**
Unless otherwise stated, when an answer is given as a range (e.g 3.5 – 4.2) then this is inclusive of the end points (e.g 3.5, 4.2) and all numbers within the range.

11 **Number in brackets after a calculation**
Where there is a number in brackets after a calculation E.g. 2 × 6 (=12) then the mark can be awarded **either** for the correct method, implied by the calculation **or** for the correct answer to the calculation.

12 **Use of inverted commas**
Some numbers in the mark scheme will appear inside inverted commas E.g. "12" × 50 ; the number in inverted commas cannot be any number – it must come from a correct method or process but the candidate may make an arithmetic error in their working.

13 **Word in square brackets**
Where a word is used in square brackets E.g. [area] × 1.5 : the value used for [area] does **not** have to come from a correct method or process but is the value that the candidate believes is the area. If there are any constraints on the value that can be used, details will be given in the mark scheme.

14 **Misread**
If a candidate misreads a number from the question. Eg. uses 252 instead of 255; method or process marks may be awarded provided the question has not been simplified. Examiners should send any instance of a suspected misread to review.

Guidance on the use of abbreviations within this mark scheme

M   method mark awarded for a correct method or partial method

P   process mark awarded for a correct process as part of a problem solving question

A   accuracy mark (awarded after a correct method or process; if no method or process is seen then full marks for the question are implied but see individual mark schemes for more details)

C   communication mark awarded for a fully correct statement(s)
           with no contradiction or ambiguity

B   unconditional accuracy mark (no method needed)

oe   or equivalent

cao   correct answer only

ft   follow through (when appropriate as per mark scheme)

sc   special case

dep   dependent (on a previous mark)

indep independent

awrt   answer which rounds to

isw   ignore subsequent working

Paper: 1MA1/2F					
Question		**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
1		40 or tens	B1	cao	Accept trailing zeros, eg 40.0 Accept forty
2		odd square	B1	stating an odd square number eg 1, 9, 25, 49, 81, etc.	
3	(a)	4.56	B1	cao	Accept trailing zeros, eg 4.560
	(b)	7300	B1	cao	Accept trailing zeros, eg 7300.0
4		4	B1	cao	
5		$\dfrac{31}{100}$	B1	cao	
6		$\dfrac{5}{7}, \dfrac{11}{15}, \dfrac{3}{4}, \dfrac{19}{25}$	M1	conversion into decimals or percentages or other equivalent form, at least two conversions correct, **or** any three fractions in correct order	0.71(...), 0.73(...), 0.75, 0.76
			A1	cao	Accept list in reverse order for this mark Accept expressed in equivalent decimals or percentages or any other appropriate form
7	(a)	$4m$	B1	cao	
	(b)	$8np$	B1	cao	
8		263.2	M1	for using the scale eg 14×18.8 **or** 14×18 **or** for the digits 2632 **or** an answer of 263	
			A1	cao	

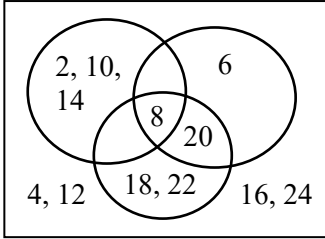| Question		Answer	Mark	Mark scheme	Additional guidance
9	(a)	Explanation	C2	full explanation eg explains that both 19 and 22 are terms in the sequence **or** solves $3n + 4 = 21$ to find $n = 17/3$ oe **Acceptable examples** 19 is in the sequence and $19 + 3$ is more than 21 The 5th term is 19 and the 6th term is 22 7, 10, 13, 16, 19, 22 17 is not in the 3 times table Because 21 is in the 3 times table and the sequence is plus 4	7, 10, 13, 16, 19, 22, ...
			(C1	for substituting to find a term in the sequence **or** forming an equation eg $3n + 4 = 21$ **or** for a partial explanation or an explanation with some ambiguity) **Acceptable examples** The closest number is 22 $3 \times 6 = 18$, $18 + 4$ is higher than 21 19 is in the sequence so 21 can't be in the sequence. Starting at 7 and adding 3 each time won't lead to 21 It's the 3 times table plus 4 21 is in the 3 times table **Not acceptable examples** Adding 4 each time won't lead to 21 It doesn't end up at 21, it goes past it	

Question		Answer	Mark	Mark scheme	Additional guidance
9	(b)	terms given	B1	states two terms eg 7,11 **or** 8,16 **or** 5, 7	
		explanation	C1	explanation eg add one more each time, doubling **Acceptable examples** Add 3 and add 4 The difference goes up by one each time It doubles +1, +2, +1, +2 or indicates +1, +2 repeats itself **Not acceptable examples** It goes up by 1 each time It doubles so 2n +1, +2, +3, +4 so 2n + 1	May be indicated on the sequence with no contradictory statement made
10	(a)	38	B1	cao	
	(b)	6	M1	starts process to find input using inverse operations eg 28 + 2 **or** sight of +2 ÷ 5 **or** by forming an equation eg $x \times 5 - 2 = 28$	+2 ÷ 5 could be seen in a flow diagram
			A1	cao	
11		4	M1	for $\dfrac{30}{100} \times 80$ (=24) oe or for 104	
			M1	(dep) for 28 – "24" or 108 – 104	Numbers in subtraction may be reversed
			A1	for 4 or –4	

Question		Answer	Mark	Mark scheme	Additional guidance
12		$\dfrac{29}{49}$	P1	for $\dfrac{29}{a}$ where $a > 29$ **or** $\dfrac{b}{49}$ where $b < 49$ **or** $1 - \dfrac{20}{49}$ **or** $\dfrac{49-20}{c}$ where $c > 49 - 20$ **OR** for 29 and 49 with incorrect notation eg 29 : 49	
			A1	oe	Acceptable equivalents are any equivalent fraction to $\dfrac{29}{49}$, decimal 0.59 (…) or 59 (…)%
13	(a)	36	P1	square root of 81 eg $\sqrt{81}$ **or** 9 **or** 9 × 4	9 could be seen on the diagram
			A1	cao	
	(b)	12	M1	finding area of triangle eg ½ (16 × 9) (=72)	
			M1	equating with area of parallelogram eg [area of triangle] × 5 = 30 × h **or** (h =) [area of triangle] × 5 ÷ 30 **or** (h =) [area of triangle] ÷ 30 **or** sight of 2.4	[area of triangle] must be 72 or 144 or come from ½ (16 × 9) or 16 × 9
			A1	cao	

Question		Answer	Mark	Mark scheme	Additional guidance
14	(a)	No (supported)	C1	No and explanation eg "it is $\frac{1}{6}$" or "each number is the same probability" **Acceptable examples** No, they are both 1/6 (accept 1 in 6 or 1 : 6 etc) No, they are both the same No, an equal chance No, it's a fair dice No, there's only one of each number **Not acceptable examples** No, it's an even chance No, it's 50 – 50 No, 1 : 6	
	(b)	No (supported)	C1	No and explanation eg "it is out of 36" or "it is $\frac{1}{6}$ times $\frac{1}{6}$" **Acceptable examples** No, the probability is 1/36 No, it's out of 36 No, he should times not add **Not acceptable examples** No, it's 1/6 × 1/6, the probability is 1/12 No, he's more likely to get it once only No, there's only one 6 on a dice No, you will have a 2/12 chance	
	(c)	1H, 2H, 3H, 4H, 5H, 6H, 1T, 2T, 3T, 4T, 5T, 6T	B2	for all 12 outcomes with no extras or repeats	Pairs must be unambiguous Accept words and abbreviations
			(B1	for at least 6 correct outcomes, ignoring extras and repeats)	

Question	Answer	Mark	Mark scheme	Additional guidance
15	2.5	M1	for $(R =)\dfrac{100I}{PT}$ **or** 600×5 (= 3000) **or** 75 × 100 (= 7500) **or** 75 ÷ 5 (= 15) **or** 75 ÷ 600 (= 0.125)	
		M1	for $\dfrac{75\times100}{600\times5}$ oe **OR** $\dfrac{"15"}{600}$ (= 0.025) **or** "0.125" ÷ 5 (= 0.025) **or** 1.025	Calculations may be done in stages. May work in decimals or in percentages
		A1	cao	
16	Reflection in *x*-axis	B1	for reflection	Award no marks if more than one transformation is given
		B1	for *x*-axis **or** *y* = 0	
17	2 bags of stone	P2	for a complete process to work out how many bags of each material is required eg 180 ÷ 25 (= 7.2 or 8), 375 ÷ 22.5 (= 16.6.. or 17), 1080 ÷ 50 (= 21.6 or 22) **or** a complete process to work out the total weight of each element that he has eg 25 × 10 (= 250), 20 × 22.5 (= 450), 50 × 20 (= 1000)	The correct figures do not need to be seen to award the process marks
		(P1	for a correct start to the process, eg for at least one correct calculation	
		C1	correct conclusion eg 2 bags of stone, with no incorrect working	

Question		Answer	Mark	Mark scheme	Additional guidance
18	(a)	explanation	C1	explanation eg should be 1.03, this is 30% (not 3%) **Acceptable examples** Because 1.3 is 130% He is increasing it by 30% 1.3 means 1.30, not 1.03 He needs to put a 0 in front of the 3 1.3 is the wrong decimal He should multiply by 0.03 3% is 0.03, (not 1.3) His answer should be 154.5 He is meant to increase it by 4.5, not by 45 **Not acceptable examples** Because he is increasing by 130%, not 3% He needs to find 1% and then times it by 3	
	(b)	(150 ×) 0.97 = 145.5	B1	for 0.97 (or $\dfrac{97}{100}$ or 97%) and 145.5	
19	(a)	8	M1	for a correct first step eg $3x - 12 = 12$ **or** $3(x - 4) \div 3 = 12 \div 3$	
			A1	cao	
	(b)	$3b(3 - b)$	M1	for $3(3b - b^2)$ **or** $b(9 - 3b)$ **or** $3b$(two term linear expression)	
			A1	cao	

Question		Answer	Mark	Mark scheme	Additional guidance
20	(a)	Venn diagram	C4	fully correct Venn diagram	
			(C3	7 of the 8 regions correct **or** for a diagram with only one number incorrectly placed)	
			(C2	5 or 6 of the 8 regions correct)	
			(C1	3 or 4 of the 8 regions correct)	
	(b)	$\dfrac{1}{12}$	M1	ft for identification of 1 or 12 eg from the diagram	Need not be written as a fraction or probability at this stage. eg could be a ratio 1:12
			A1	ft oe	Acceptable equivalents are (eg, could ft) any fraction equivalent to $\dfrac{1}{12}$, 0.08(33..) or 8(.33..)%
21		statements	C1	for lobf incorrect **Acceptable examples** lobf lobf does not suit all points/not a lobf lobf wrong since hits x axis/is inaccurate/should be amongst the crosses lobf goes through the origin/through one point **Not acceptable examples** no correlation/there is no title	
			C1	for height scale not linear **Acceptable examples** 150 missing Height not linear / Height numbers going up wrong **Not acceptable examples** 150 graph does not start at 140/graph does not start at 0 height should start at 170	

Question	Answer	Mark	Mark scheme	Additional guidance
22	60	M1	use of parallel lines to find an angle eg *ABE*=70 **or** *EBG*=75 **or** *EBC* = 110 **or** shows parts of *x* as 35 or 25	Parts of *x* should be identified on the diagram by the insertion of a dividing line through angle *x* (need not be identified or drawn parallel).
		M1	for a complete method to find angle *x*; could be in working or on the diagram	Correct method can be implied from angles on the diagram if no ambiguity or contradiction.
		A1	for *x* = 60	
		C1	(dep on M1) for one reason linked to parallel lines and one other reason, supported by working taken from: alternate angles are equal, allied angles / co-interior angles add up to 180, angles on a straight line add up to 180, angles in a triangle add up to 180°	Underlined words need to be shown; reasons need to be linked to their method; any reasons not linked do not credit. There should be no incorrect reasons given.

Question		Answer	Mark	Mark scheme	Additional guidance
23	(a)	Ben (supported)	P1	shows how to work interest out for one year eg 2000 × 0.025 (= 50) **or** 1600 × 0.035 (= 56) **or** 150 **or** 168 **or** 2000×1.025 (= 2050**)** or 1600 × 1.035 (= 1656)	Throughout accept figures ±1 pence which do not need to be presented in money notation (to 2dp) or with monetary symbols.
			P1	shows compound interest calculation for one account eg 2050→51.25 **or** 2101.25→52.53 or 1656→57.96 **or** 1713.96→59.99 eg 2000×1.025^3 (= 2153.78**)** or 1600 × 1.035^3 (= 1773.95)	Award mark for a correct process shown, for which these figures can be taken as implying the process.
			P1	shows complete compound interest calculation for both accounts eg 2000×1.025^3 (= 2153.78**) and** 1600 × 1.035^3 (= 1773.95) OR one interest stated correctly eg 153.78 **or** 173.95	As above, award mark for both correct processes shown for both accounts, which these figures can be taken as implying the process.
			C1	Ben (shares) supported by 153.78 **and** 173.95	Accept an answer of "shares".
	(b)	conclusion	C1	conclusion (ft) eg no change, shares now 182.5… **Acceptable examples** no since shares/Ben now 182.5 Still Ben since 182.5 > Ali No; he only gets 8.57 more No; he gets 68.56 instead of 59.98 (3rd yr) No; Ben already gets more interest, he would just get even more **Not acceptable examples** no shares now 182.5 Still Ben since less than Ali 182.5 > 153.78 no; he needs 20.17 more .	Conclusion needs to be supported. ft is from part (a); calculations carried out as part of (b) need to be correct for the comparison to be valid.

Question	Answer	Mark	Mark scheme		Additional guidance
24	No (supported)	P1	calculates area of trapezium eg ½ × 7 × (10+16) (= 91)		
		P1	for division by coverage eg ÷2 or [area of trapezium] ÷ 2 (= 45.5) or process to find coverage per tin eg 5 × 2 (= 10)	for process to find number of tins bought eg 160 ÷ 16.99 = 9 tins	[area of trapezium] needs to be clearly stated if the process of finding the area is not clear
		P1	for division to find the number of tins eg ÷5 or "45.5" ÷ 5 (= 9.1) **or** [area of trapezium] ÷ "10" (= 9.1)	for using whole no. of tins to find total litres eg 9 × 5 (= 45)	
		P1	(dep on at least P2) for a process to multiply a whole number of tins (rounded up) by 16.99	(dep on at least P2) for a process to find the total coverage eg "45" × 2 (= 90)	
		C1	for 'No' supported by correct figures eg 169.9 or 90 **and** 91		There must be a conclusion ("No" or equivalent wording) including the figure 169.9 and working showing processes followed.
25	7	P1	process to use gradient eg $y = 3x + c$ **or** c = −6 **or** $\dfrac{15-9}{d-5}$ **or** (15 − 9) ÷ 3 **or** (6, 12)		Condone use of a letter other than *d*, for *d*
		P1	(dep) full process to rearrange equation formed to isolate *d* eg rearrangement of 15 = 3*d* − 6 or 3 = $\dfrac{15-9}{d-5}$ **or** for 5 + $\dfrac{15-9}{3}$		Must show processes to get as far as *d* = Award P2 for an answer of (7, 15)
		A1	cao		

Question		Answer	Mark	Mark scheme	Additional guidance
26	(a)	$10x^2 - 11x - 6$	M1	for 3 out of no more than 4 terms correct with correct signs **or** 4 correct terms ignoring signs	$10x^2 - 15x + 4x - 6$ NB: $10x^2 - 11x$ and $-11x - 6$ are indicative of 3 correct terms.
			A1	cao	
	(b)	$(x + 1)(x + 3)$	M1	for $(x \pm 1)(x \pm 3)$ **or** for $(x + a)(x + b)$ where either $ab = 3$ or $a + b = 4$	
			A1	cao	
27	(a)	7.547×10^{-5}	B1	cao	
	(b)	34200	B1	cao	
	(c)	3.082×10^{15}	M1	for $\dfrac{23000 \times 6700}{0.00000005}$ **OR** for one calculation eg 1.541×10^8 **or** $154\,100\,000$ **or** 4.6×10^{11} **or** 1.34×10^{11}	
			A1	for 3.082×10^{15} oe	Answer could be given as an ordinary number.

Modifications to the mark scheme for Modified Large Print (MLP) papers. Paper 2F.

Only mark scheme amendments are shown where the enlargement or modification of the paper requires a change in the mark scheme.

The following tolerances should be accepted on marking MLP papers, unless otherwise stated below:
Angles: ±5°
Measurements of length: ±5 mm

PAPER: 1MA1_2F			
Question		**Modification**	**Mark scheme notes**
10		Wording changed from 'Here is' to 'It shows'.	Standard mark scheme
13	(a)	Wording changed from 'A square has' to 'It shows a square with'. Diagrams enlarged.	Standard mark scheme
13	(b)	Top of the parallelogram labelled 30 cm. Braille only – triangle labelled ABC and parallelogram DEFG, added information about the shapes	Standard mark scheme
16		Diagram enlarged. Shading changed to dotty shading. Wording deleted from inside the shapes. Shapes labelled 'shape A' and 'shape B', above and below respectively. Wording added 'It shows shape A and shape B on a grid.' K and V only – shape provided.	Standard mark scheme
17		Table turned to vertical format.	Standard mark scheme
19	(b)	Braille and MLP – b changed to y.	Standard mark scheme but b changed to y.
20		Diagram enlarged. Wording added 'It shows a Venn diagram.' Circles labelled 'set A', 'set B' and 'set C'. Braille only – sticky labels provided.	Standard mark scheme
21		Diagram enlarged. Crosses changed to solid dots. Axes labels moved to the right of the horizontal axis and above the vertical axis. Wording changed from 'Here is his answer.' to 'His answer is shown in the Diagram Book.'	Standard mark scheme

PAPER: 1MA1_2F			
Question		**Modification**	**Mark scheme notes**
22		Diagram enlarged. Arrows moved further to the right and made bigger. Angles moved outside of the angle arcs and angle arcs made smaller. Wording added 'Angle CBG = 35°, Angle BED = 110°, Angle GEF = 25°, Angle BGE is marked *x*.' Wording changed from 'Work out the size of angle *x*.' to 'Work out the size of the angle marked *x*.	Standard mark scheme
24		Diagram enlarged and a model provided for all candidates. Wording added 'The diagrams show a floor in the shape of a trapezium and a tin of paint. The model represents the tin of paint.' Braille only – parallelogram labelled ABCD, added information about the shape.	Standard mark scheme
26	(a)	MLP only – *x* changed to *y*.	Standard mark scheme with *x* changed to *y*
26	(b)	MLP only – *x* changed to *y*.	Standard mark scheme with *x* changed to *y*