Mark Scheme (Results)

Summer 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
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		8	B1	cao	
2		1.6	B1	cao	
3		243	B1	cao	
4		Suitable number eg. 564 000	B1	for a suitable 6 digit number with 4 as thousands digit	Can be a decimal eg 4652.99, 4625.90
5	(a)	350	B1	cao	Accept trailing zeros eg 350.0
	(b)	7.7	B1	cao	Accept trailing zeros eg 7.70
	(c)	320	B1	cao	Accept trailing zeros eg 320.0
6		3 and 9	P1	for starting to list factors of 36 **or** multiples of 3 **or** odd numbers	Must be at least 3.
			A2	cao	In either order
			(A1	for one correct answer)	
7		(MYL) (MLY) (YML) (YLM) (LMY) (LYM)	M1	for at least 3 correct different combinations	for M1 ignore extras or repeats; accept words or unambiguous abbreviations
			A1	fully correct list with no extras or repeats	

Paper: 1MA1/2F					
Question		**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
8		19.85	P1	for a start to the process eg 30 ÷ 6 (=5) **or** 30 ÷ 15 (=2) **or** 30 ÷ 10 (=3) **OR** 30 × 37 (=1110) **OR** 82 ÷ 6 (=13.6 to 13.7) **or** 45 ÷ 15 (=3) **or** 1.25 ÷ 10 (=0.125)	
			P1	for process to find cost of 30 pens **or** 30 pencils **or** 30 rulers eg "5" × 82 (= 410) **or "**2" × 45 (= 90) **or** "3" × 1.25 (= 3.75) **OR "**13.6.." × 30 (=409.8 to 410) **or** "3" × 30 (=90) **or** "0.125" × 30 (=3.75)	Work may be in pence or in pounds
			P1	for a process to find cost of 2 of 30 pens **or** 30 pencils **or** 30 rulers eg any 2 of "5" × 82 (= 410) **,** **"**2" × 45 (= 90) **,** "3" × 1.25 (= 3.75)	Intention to add not necessary eg 410, 3.75 is sufficient, or working leading to these figures Any two correct methods will imply P1P1P1
			P1	for adding at least 3 different costs (units may not be consistent) eg "410" + "90" + "3.75" **or** "410" + "90" + "11.10"	Correct working for 3 of pens, pencils, rulers and pencil cases with an intention to add, may be in a mixture of money units
			A1	cao	
9	(a)	62	M1 A1	for distance ÷ time eg 186 ÷ 3 **or** 186 ÷ (3× 60)(=1.03..) cao	May use hours or minutes at this point
	(b)	232	M1 A1	for speed × time eg 58 × 4 **or** 58 × 4 × 60 (=13920) cao	May use hours or minutes at this point

Paper: 1MA1/2F					
Question		**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
10	(a)	23, 29	B2	for 23 **and** 29 **and** no extras	
			(B1	for one correct **and** no more than one incorrect)	2 correct and 1 incorrect award B1
	(b)	Explanation	C1	for decision **and** explanation eg yes and because all other even numbers have 2 as a factor	Decision is required may be yes or implied by she is ... oe. Do not accept statements that are ambiguous, or contradictory
11	(a)	17	B1	cao	
	(b)	12	B1	cao	
	(c)	5.5	B1	Accept $\frac{11}{2}$, $5\frac{1}{2}$ oe	
12		Correct pie chart	M1	for method to find at least one angle eg B: 360 ÷ "36" × 11 (= 110) **or** P: 360 ÷ "36" × 17 (= 170) **or** HD: 360 ÷ "36" × 8 (= 80)	Accept numbers if present in Number of fan column eg 0 added to a number is acceptable for this mark.
			A1	for at all 3 angles correctly calculated **OR** at least one accurately drawn angle	
			A1	for a fully correct labelled pie chart	Labels as "snacks" from table not just angle size.

Paper: 1MA1/2F					
Question		**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
13		$\frac{338}{350}$	M1 A1	for 350 – 12 (=338) **or** $\frac{y}{350}$ oe where $y < 350$ **and** $y \neq 12$ **or** $1-\frac{12}{350}$ oe oe	For the method mark probability fractions can be expressed as equivalent expressions, even if not correct probability notation eg. 338 : 350 scores M1 A0 Using correct probability notation Allow 0.96 to 0.97 or 96% to 97%
14		22 **4** 45 **18** **7** 16 **23**	C1 C1 C1	for correctly placing at least one piece of data (22 or 16) **OR** for finding at least one unknown piece of data (4, 18, 7 or 23) for correctly placing at least one piece of data (22 or 16) **and** for finding at least one unknown piece of data (4, 18, 7 or 23) for a complete correct tree. **SC C2** if all 6 figures are shown as the numerator of fractions in the correct places	Unknown figures may be seen in working and need not be on the diagram Award of this mark implies the first C1
15	(a) (b)	Correct evaluation Correct or corrected reasoning given	C1 C1	for explanation eg x is not a base angle or states $x = 54°$ eg (because) alternate angles are equal, **or** Allied angles / Co-interior angles add up to 180 **or** they are not corresponding (they are alternate) **OR** selects correct reason used by William	

Paper: 1MA1/2F					
Question		**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
16		5	P1	for start to process eg 7 × 20 (= 140) **and** 3 × 21 (= 63) **or** (7 × 20) + (3 × 21) + 22 (= 225)	May be written near table 7 × 20 (= 140) **and** 3 × 21 (= 63) minimum requirement for P1
			P1	for a complete process to find the missing frequency eg (320 – "225") ÷ 19 **or** 320 – "225" = (95) **and** "95" ÷ 19	May be seen as two calculations
			A1	cao	Please check the table. Correct answer in the table without working award 3 marks
17		90	P1	for a process to find the number of batches for at least 2 ingredients, eg 900 ÷ 225 (= 4) **or** 1000 ÷ 110 (= 9.09..) **or** 1000 ÷ 275 (= 3.6……) **or** 225 ÷ 75 (= 3) **OR** A full method to find the maximum number of biscuits for 1 ingredient eg 900 ÷ 225 × 30 **OR** Amount required for 1 biscuit for at least 2 ingredients eg 225 ÷ 30 (= 7.5) **or** 110 ÷ 30 (= 3.6..) **or** 275 ÷ 30 (= 9.1..) **or** 75 ÷ 30 (= 2.5) **OR** Amount required for 3 batches for at least 2 ingredients eg 225 × 3 (= 675) **or** 110 × 3 (= 330) **or** 275 × 3 (=825) **or** 75 × 3 (= 225)	
			P1	(dep P1) for a complete process to find the maximum number of biscuits after considering at least 3 different ingredients eg "3" × 30	They must use their smallest multiplier after considering at least 3 different ingredients
			A1	(dep P2) cao from fully correct working	90 without working award no marks

Paper: 1MA1/2F					
Question		**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
18		Correct description	B2 (B1	reflection **and** *y* axis **or** reflection **and** $x = 0$ reflection **or** *y* axis **or** $x = 0$)	If more than 1 transformation given award B0
19		4378.2(0)	P1 P1 P1 P1 A1	for a process to find the circumference of the circle **or** the semi circle, eg $\pi \times 50$ (= 157.0796327) **or** $0.5 \times \pi \times 50$ (= 78.53981634) for a complete process to find the perimeter of the field, eg $(0.5 \times \pi \times 50) + 50$ (= 128.5...) **OR** for working with one cost eg "157.07…" × 29.86 (= 4690.11..) **or** "78.5…" × 29.86 (= 2345.198…) **or** 50 × 29.86 (=1493) **or** 3 × 180 (= 540) For finding the costs of two different aspects eg 2 of "78.5…" × 29.86 (= 2345.1..) **or** 50 × 29.86 (= 1493) **or** 3 × 180 (= 540) for a adding at least 2 costs eg "2345.1.." + "540" (=2885.1..) **or** "1493" + "540" (=2033) **or** "128.5…" × 29.86 (= 3838.2..) for answer in the range 4377 – 4392	Figures may be truncated or rounded May use circle at this point, figures imply method One cost is 1 length or labour Figures may be truncated or rounded Two different aspects means arc and straight edge or arc and labour or straight edge and labour Condone circle and labour or circle and straight edge. Finding the cost of the perimeter is two costs added and so implies the previous P1 The circle is not allowed to be counted as one of the two costs for this mark

Paper: 1MA1/2F					
Question		**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
20	(a)	m^7	B1	cao	
	(b)	$125n^3p^9$	B2	cao	Allow multiplication signs
			(B1	for 2 of 3 terms correct in a single product)	$125n^3p^x$ or $125n^xp^9$ where $x \neq 0$ or an^3p^9 where a is a number
	(c)	$8q^6r^3$	B2	cao	Allow multiplication signs
			(B1	for 2 of 3 terms correct in a single product)	$8q^6r^x$ or $8q^xr^3$ where $x \neq 0$ or aq^6r^3 where a is a number
21	(a)	280	M1	for listing at least 3 multiples of both 40 and 56 **OR** finds the prime factors of both 40 and 56	40, 80, 120, … 56, 112, 168, … **OR** 2,2,2,5 and 2,2,2,7
			A1	cao	
	(b)	60	B1	60 **or** $2^2 \times 3 \times 5$ oe	2^2, 3, 5 not enough ie must be a product
22		$y = 3x - 6$	M1	for a correct method to find the gradient of the line, or $m = 3$ **OR** identifies −6 as the intercept in words or in a partial equation **OR** $y - b = m(x - a)$ where $m \neq 3$ and (a, b) is a correct coordinate	Just ringing -6 is insufficient
			M1	for $y = 3x + c$ **or** (L=) $3x - 6$ **or** $y =$ "3"$x - 6$ **OR** $y - y_1 = 3(x - x_1)$ **or** $y - b =$ "3"$(x - a)$ where (a, b) is a correct coordinate	Award of this mark implies the first M1 c must be seen either as a letter or a number
			A1	accept $y = 3x +$ −6 oe	

Paper: 1MA1/2F					
Question		**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
23		3 : 5	P1	for process to find 20% **or** 120% of the cost, eg 8500 × 0.2 (= 1700) oe **or** 8500 × 1.2 (= 10 200) oe	When partitioning all figures quoted must be correct or a full method shown eg 10% = 8500 ÷ 10 (=850) and 20% = "850" + "850" (=1700)
			P1	for process to find total cost of payments, eg 12 × 531.25 (= 6375)	
			P1	for complete process to find value of deposit, eg "10 200" – "6375" (= 3825) **or** 8500 – "6375" (=2125) **and** "2125" + "1700" (=3825) **OR** the deposit as a proportion of the total cost, eg $1 - \frac{"6375"}{"10200"}$ $(=\frac{3}{8})$	May be seen as a fraction of the total eg $\frac{3825}{10200}$ $(=\frac{3}{8})$
			P1	for finding a correct un-simplified ratio, eg "3825" : "6375" oe **or** 5:3 **or** $1.\dot{6}$: 1 **or** $\frac{5}{3}$: 1	Figures at this stage must be expressed as part of a ratio eg 51:85, $\frac{3}{8} : \frac{5}{8}$
			A1	Accept 1: $1.\dot{6}$, 1: $\frac{5}{3}$	Ignore consistent units
24	(a)	0, –4, –6, –4, 0	B2 (B1	fully correct figures At least 2 correct figures)	
	(b)	Graph	M1 A1	(dep B1) for at least 5 points correctly plotted ft from (a) fully correct graph	Must be a curve
	(c)	2.6 and –1.6	M1	for $y = -2$ drawn **or** intersections with $y = -2$ **or** $y = x^2 - x - 4$ drawn **or** 1 correct value	If answers stated as coordinates, award M1 for both coordinates and M0 for one coordinate
			A1	ft a quadratic graph **or** for answers in the range 2.5 to 2.7 **and** –1.5 to –1.7	

Paper: 1MA1/2F					
Question		**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
25		No (supported)	P1	For a process to calculate the initial or new pressure, eg (70 +10) ÷ (20+10) (=2.6 to 2.7) **or** 80 ÷ 30 (=2.6 to 2.7) **or** 70 ÷ 20 (=3.5)	Accept any value in the range 2.6 to 2.7 if unsupported by working
			P1	For a complete process to make a comparison eg. 0.8 × "3.5" (=2.8) **OR** $\frac{("3.5"-"2.6")}{"3.5"} \times 100$ (=22 to 26) **OR** "3.5" × 0.2 (=0.7) **and** 80 ÷ 30 (=2.6 to 2.7) **OR** $\frac{"2.6"}{"3.5"}$ (× 100) (=0.74 to 0.78 **or** 74 to 78)	
			A1	for a correct conclusion supported by accurate figures eg 2.8 **and** 2.6(6…) **OR** decrease is 24% (or 22% to 26%) **OR** 0.7 **and** 2.6 to 2.7 **and** 3.5 **OR** 0.7 **and** 0.9 **OR** 0.76 (or 0.74 to 0.78) **OR** 76% (or 74% to 78%)	Allow truncation or rounding of figures

Paper: 1MA1/2F					
Question		**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
26		280	P1	for starting to use Pythagoras to find the missing side eg $8.4^2 - 7.2^2$ (= 18.72)	Award P1 for a correct Pythagorean statement eg $x^2+7.2^2=8.4^2$
			P1	for a complete process to find the missing side eg $\sqrt{70.56-51.84}$ **or** $\sqrt{18.72}$ (=4.32....)	4.3 truncated or rounded can imply P2
			P1	(dep P1) for a process to find the area of the triangular face eg [length of base] × 7.2) ÷ 2 (=15.57..) **OR** the volume of the cuboid eg [length of base] × 7.2 ×18 (=560.7..)	Uses a figure they show as the length of the base of the right angled triangle but dep on P1 Allow 15.57.. truncated or rounded if unsupported
			P1	for a complete process to find the volume of the prism eg "15.5.." × 18 **or** "560.7.." ÷ 2	
			A1	answer in the range 278 – 281	If an answer is given in the range 278 to 281 but then incorrectly given to 3 sig fig this mark can still be awarded.

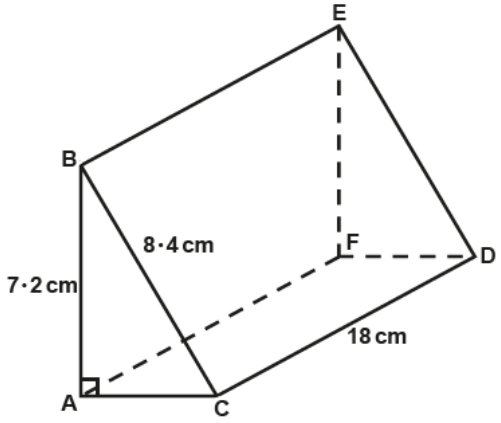
Modifications to the mark scheme for Modified Large Print (MLP) papers.

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: ±5º
Measurements of length: ±5 mm

Paper: 1MA1/2F			
Question		**Modification**	**Mark scheme notes**
7		9 rows have been added to the table. Wording added 'You may not need to use all the rows.'	Standard mark scheme
8		Horizontal lines added to the information.	Standard mark scheme
11	(a)	MLP only: x changed to t	Standard mark scheme but for MLP *x* changed to *t*
11	(c)	Braille only: f changed to m	Standard mark scheme but for Braille *f* changed to *m*
12		Diagram enlarged. 10 degree markings and a dot at the centre have been added to the pie chart.	Standard mark scheme
14		Diagram enlarged. Wording added 'There are six spaces to fill.' Braille will label the answer spaces as shown below. (iii) (i) (iv) 45 (v) (ii) (vi)	Standard mark scheme

Paper: 1MA1/2F			
Question		**Modification**	**Mark scheme notes**
15	(a)	Diagram enlarged. Angles moved outside of the angle arcs, and the arcs have been made smaller. Lines have been made longer. Wording added 'The diagram shows triangle ABC. AC = BC Angle ABC = 63° Angle ACB is marked x.'	Standard mark scheme
15	(b)	Diagram enlarged. Angles moved outside of the angle arcs, and the arcs have been made smaller. Arrows have been made longer Wording added 'In the diagram, DE is parallel to FGH. Angle DEG = 57° Angle FGE is marked y.'	Standard mark scheme
16		Wording added 'There is one space to fill.' Braille will label the answer space (i).	Standard mark scheme
17		Horizontal lines added to the information.	Standard mark scheme
18		Diagram enlarged. Shading changed to dotty shading. *y* axis cut to go from -2 to 5. Shapes labelled 'shape A' and 'shape B'.	Standard mark scheme
19		Diagram enlarged	Standard mark scheme
22		Diagram enlarged	Standard mark scheme
24	(a)	Table has been turned to vertical format and left aligned. Wording added 'There are five spaces to fill.' Braille will label answer spaces (i) to (v) from left to right.	Standard mark scheme
24	(b)	Diagram enlarged	Standard mark scheme

Paper: 1MA1/2F			
Question		**Modification**	**Mark scheme notes**
26		Model provided for all candidates. Diagram enlarged and also provided for MLP. Dashes made longer and thicker. Edges of the prism have been labelled A to F. Wording added 'They show a right angled triangular prism. AB = 7.2 cm BC = 8.4 cm CD = 18 cm Angle BAC is a right angle.'  	Standard mark scheme

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