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## Mark Scheme (Results)

Summer 2019

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.  $2 \times 6 (=12)$  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"  $\times$  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]  $\times$  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

<b>M</b>	method mark awarded for a correct method or partial method
<b>P</b>	process mark awarded for a correct process as part of a problem solving question
<b>A</b>	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)
<b>C</b>	communication mark awarded for a fully correct statement(s) with no contradiction or ambiguity
<b>B</b>	unconditional accuracy mark (no method needed)
<b>oe</b>	or equivalent
<b>cao</b>	correct answer only
<b>ft</b>	follow through (when appropriate as per mark scheme)
<b>sc</b>	special case
<b>dep</b>	dependent (on a previous mark)
<b>indep</b>	independent
<b>awrt</b>	answer which rounds to
<b>isw</b>	ignore subsequent working

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
1	$\frac{3}{4}$	B1	for $\frac{3}{4}$ or any other equivalent fraction	
2	-3, -1, 0, 2, 4	B1	for -3, -1, 0, 2, 4	Accept reverse order
3	At least <b>two</b> of 1, 3, 5, 15	B1	for at least two of 1, 3, 5, 15 with no incorrect values	Accept $3 \times 5$ etc.
4	1.756	B1	cao	
5	2 000 000	B1	for 2 000 000 or $2 \times 10^6$	
6	Yes and statement	P1  P1  C1	for a first step towards solution, eg. $2 \times 2.75 (= 5.5)$ or $2.75 + 2.9 (= 5.65)$ <b>OR</b> $10 - 1.5 (= 8.5)$ or $10 - 2.9 (= 7.1)$ or $10 - 2.75 (= 7.25)$  for a complete process to find figures to compare eg. $2 \times 2.75 + 2.9 + 1.5 (= 9.90)$ or $10 - (2 \times 2.75 + 2.9) (= 1.60)$ <b>OR</b> $2 \times 2.75 + 2.9 (= 8.40)$ <b>and</b> $10 - 1.5 (= 8.5)$  for correct conclusion with accurate figure(s) eg. Yes and (£)1.6(0) <b>or</b> Yes and (£)9.9(0) <b>or</b> Yes and (£)8.4(0) <b>and</b> (£)8.5(0)	
7	7y	B1	for 7y oe	Accept $7 \times y$ oe Accept a formula, eg. $P = 7y$ but <b>not</b> $y = 7y$

Paper: 1MA1/2F					
Question	Answer	Mark	Mark scheme	Additional guidance	
8	(a) $7ab$	B1	for $7ab$		
	(b) $y^3$	B1	cao		
	(c) $\frac{e}{f}$	M1	for a correct first step, eg. numerator of $e^{3 \times f}$ or denominator of $e^2 \times f^2$ <b>OR</b> $e \div f$ or $e \times f^{-1}$ <b>OR</b> relevant crossings out for all the $e$ 's <b>and</b> all the $f$ 's		
		A1	for $\frac{e}{f}$ or $ef^{-1}$		
9	(a)(i) 24	B1	cao		
	(ii) 18	B1	cao		
	(b) Diagram	M1	for $36 \div 9$ or for using ratio 1 : 8 or setting up $w + 8w (=36)$	Fully correct diagram with no method shown gets all 3 marks	
		A1	for 4 and 32		
		C1	for correct diagram or ft (dep on M1) for drawing "4" and "32"	SC: B2 for 4 full circles for Wed <b>and</b> half a circle for Thursday SC: B1 for either Wed correct or for Thurs correct in the diagram if M0 scored	
10	$14 < 21$ $4+7 = 103 - 92$ $2^2 = 2 \times 2$ $-3 > -5$	B2	for all 4 correct		
		(B1)	for 2 or 3 correct)		

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
11	23	M1 A1	for substitution eg. $7 \times 5$ and $3 \times -4$ or $7(5) + 3(-4)$  cao	$7 \times 5 (= 35)$ and $3 \times -4 (= -12)$ may be seen separately but both must be seen for the award of M1
12 (a)	7	B1	cao	
(b)	1 hr 38 mins	M1  A1	for a complete method to find the time difference eg. $9\ 00 - 7\ 22$ <b>OR</b> a calculation on a number line, may be seen in any time format <b>OR</b> work in parts eg hours and minutes, may work in any units, eg. $60 - 22 (= 38) + 1$ hour <b>OR</b> a clear build up method from $07\ 22$ to $09\ 00$ <b>OR</b> for correct values seen in an incorrect format, eg. 1.38 or 1:38 or 98 without units  1 hr 38 (mins) or 98 minutes or 1.6 $\dot{3}$ hrs	
13	10	P1 P1 A1	for starting the problem, $12 \div 6 (=2)$  for a complete process to find width " $2$ " $\times 5$  cao	The square of side 2 cm may be just seen on the diagram
14	2 : 1	B1	cao	

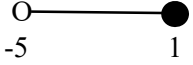


Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
15	3240	P1	for $90 \times 60 (= 5400)$ <b>OR</b> $40 \div 100 \times 90 (= 36)$ <b>OR</b> $40 \div 100 \times 60 (= 24)$	
		P1	for a process to work out area that is flowers eg. $40 \div 100 \times "5400" (= 2160)$ <b>OR</b> $"36" \times 60 (= 2160)$ <b>OR</b> $90 \times "24" (= 2160)$	
		P1	for a full process to find the area that is grass eg. $"5400" - "2160" (= 3240)$	
		A1	cao	
		P1	<b>ALTERNATIVE</b> for $100 - 40 (= 60)$	
		P1	(indep) for $90 \times 60 (= 5400)$ <b>OR</b> $90 \times 60 \div 100 (= 54)$ or $60 \times 60 \div 100 (= 36)$	
		P1	for a full process to find the area that is grass eg. $"60" \div 100 \times "5400" (= 3240)$ <b>OR</b> $"54" \times 60 (= 3240)$ or $"36" \times 90 (= 3240)$	
		A1	cao	

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
16 (a)(i)	B	B1	for B, accept 0.033 on the answer line	Accept rounded conversions <b>seen</b> to decimals or percentages if the reasoning is correct
(ii)	C	B1	for C, accept $\frac{1}{3}$ on the answer line	
(b)	Statement	C1	eg No with $(\frac{1}{3})$ and $\frac{2}{3}$ or No, probabilities would need to be $\frac{1}{2}$ or No since $\frac{1}{3} + \frac{1}{3}$ does not equal 1 or No since tails is 67% (or 0.67)	
(c)	132	M1	for $4000 \times 0.033$	
		A1	<b>OR</b> $\frac{132}{4000}$ cao	
				132 out of 4000 is an acceptable answer

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
17	180.9	P1	for starting to work with proportion eg. $60 \div 100 (= 0.6)$ or $150 \div 100 (= 1.5)$ <b>OR</b> $100 \div 60 (= 1.66..)$ or $100 \div 150 (= 0.66..)$ <b>OR</b> $84 \div 100 (= 0.84)$ or $87 \div 100 (= 0.87)$ or $84 \div 10 (= 8.4)$ or $87 \div 10 (= 8.7)$ or $84 \div 2 (= 42)$ or $87 \div 2 (= 43.5)$ <b>OR</b> $100 \div 84 (= 1.19..)$ or $100 \div 87 (= 1.14..)$	
		P1	for a complete process to work out the calories in either item eg. $“0.6” \times 84 (= 50.4)$ or $“1.5” \times 87 (= 130.5)$ <b>OR</b> $84 \div “1.66..” (= 50.4)$ or $87 \div “0.66..” (= 130.5)$ <b>OR</b> $“0.84” \times 60 (= 50.4)$ or $“0.87” \times 150 (= 130.5)$ or $“8.4” \times 6 (= 50.4)$ or $“8.7” \times 15 (= 130.5)$ or $“42” \times 6 \div 5 (= 50.4)$ or $“43.5” \times 3 (= 130.5)$ <b>OR</b> $60 \div “1.19..” (= 50.4)$ or $150 \div “1.14..” (= 130.5)$	
		P1	(dep on P2) for a complete process to find total number of calories in the breakfast, eg. $“50.4” + “130.5”$	
		A1	for 180.9 or 181	

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
18	952	P1  P1  P1  A1	<p>for starting to work with parts, eg. <math>6 \times 60 \div 10 (= 36)</math> or <math>10 \div 6 (= 1.66..)</math> or <math>6 \div 10 (= 0.6)</math> or <math>13 \times 60 \div 15 (= 52)</math> or <math>15 \div 13 (= 1.15..)</math> or <math>13 \div 15 (= 0.866..)</math> <b>OR</b> for <math>60 \div 10 \times 12 (= 72)</math> or <math>10 \times 60 \div 15 (= 40)</math></p> <p>for a full process to find the number of parts made by machine A eg “36” <math>\times 12 (= 432)</math> or <math>12 \times 60 \div “1.66..” (= 432)</math> or <math>12 \times 60 \times “0.6” (= 432)</math> <b>OR</b> “72” <math>\times 6 (= 432)</math></p> <p>for a full process to find the number of parts made by machine B eg “52” <math>\times 10 (= 520)</math> or <math>10 \times 60 \div “1.15..” (= 520)</math> or <math>10 \times 60 \times “0.866..” (= 520)</math> <b>OR</b> “40” <math>\times 13 (= 520)</math></p> <p>for 952 or 432 <b>and</b> 520</p>	
19	Shaded region	M1  M1  M1  A1	<p>for <math>180 \div 30 (= 6)</math> or <math>150 \div 30 (= 5)</math></p> <p>draws an arc of radius “6 cm” centre <math>A</math> or draws a line segment parallel to <math>BC</math> and “5 cm” away</p> <p>for an arc of radius “6 cm” centre <math>A</math> <b>and</b> a line parallel to <math>BC</math> and “5 cm” away with no additional arcs or lines drawn</p> <p>Answer within tolerance with region shaded</p>	<p>This may be just used in a correct locus drawn on the diagram</p> <p>Ignore any additional arcs or lines drawn</p> <p>Accept shading out leaving the required region unshaded</p>

Paper: 1MA1/2F																				
Question	Answer	Mark	Mark scheme	Additional guidance																
20 (a)	$n > 2$	M1	for a method to isolate terms in $n$ in any inequality or equation eg. $14n - 11n > 6$ or $n = 2$	Ignore incorrect inequality sign and accept “=” sign  A circle around $-5$ and $1$ implies M1  A line from $-5$ to $1$ implies M2 if no working shown																
(b)		A1	cao																	
		M1	for $-2 - 3 < x \leq 4 - 3$ ( $-5 < x \leq 1$ )																	
		M1	for drawing a line from $-5$ to $1$ <b>or</b> (indep) for an open circle at either $-2$ or $-5$ <b>or</b> (indep) for a closed circle at $4$ or $1$																	
		A1	cao																	
21	Graph	B3	for a correct line between $x = -2$ and $x = 4$	Ignore any incorrect points. Points need not be plotted for a correct line (segment) drawn  Table of values <table border="1" data-bbox="1541 922 2024 1002"> <tr> <td><math>x</math></td> <td><math>-2</math></td> <td><math>-1</math></td> <td><math>0</math></td> <td><math>1</math></td> <td><math>2</math></td> <td><math>3</math></td> <td><math>4</math></td> </tr> <tr> <td><math>y</math></td> <td><math>-7</math></td> <td><math>-5</math></td> <td><math>-3</math></td> <td><math>-1</math></td> <td><math>1</math></td> <td><math>3</math></td> <td><math>5</math></td> </tr> </table>	$x$	$-2$	$-1$	$0$	$1$	$2$	$3$	$4$	$y$	$-7$	$-5$	$-3$	$-1$	$1$	$3$	$5$
$x$	$-2$	$-1$	$0$		$1$	$2$	$3$	$4$												
$y$	$-7$	$-5$	$-3$		$-1$	$1$	$3$	$5$												
		(B2)	for a correct straight line segment through at least 3 of $(-2, -7), (-1, -5), (0, -3), (1, -1), (2, 1), (3, 3), (4, 5)$  <b>or</b> for all of these points plotted but not joined  <b>OR</b> for a line drawn with a positive gradient through $(0, -3)$ <b>and</b> clear intention to use a gradient of 2, eg line through $(0, -3)$ going across 2 squares and up 4 squares )																	
		(B1)	for at least 2 correct points stated or plotted  <b>OR</b> for a line drawn with a positive gradient through $(0, -3)$  <b>OR</b> a line with gradient 2)																	

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
22 (i)	65	M1	for working with proportion eg. $10 \div 30 \times 195 (= 65)$	Condone use of 200 for 195
(ii)	statement	A1 C1	cao for statement  <b>Acceptable examples</b> sample is representative (otherwise answer wrong) random sample (otherwise answer will be different) the 30 students are from the 195 (otherwise not accurate) 10 out of every 30 want to go to the Theme Park (otherwise answer will be different/wrong) there is no bias  <b>Not acceptable examples</b> There would be more than 10 people who want to go to the Theme Park I rounded my answer	
23	8	P1  P1  P1  A1	for working with volume of the cuboid, eg $30 \times 6 \times 19 (= 3420)$ <b>OR</b> for using $\frac{2}{3}$ with one dimension, eg. $30 \times 2 \div 3 (= 20)$  for “3420” $\times 2 \div 3 (= 2280)$ or “3420” $\div 3 (= 1140)$ <b>OR</b> “20” $\times 6 \times 19 (= 2280)$ <b>OR</b> “3420” $\div 275 (= 12.4\dots = 12 \text{ cups})$  (dep on P2) for “2280” $\div 275 (= 8.29\dots)$ <b>or</b> “1140” $\div 275 (= 4.14\dots)$ <b>OR</b> “12” $\times 2 \div 3$ <b>OR</b> for $275 \times 8 (= 2200)$ <b>or</b> $275 \times 9 (= 2475)$  cao	For P marks, ignore attempts at unit conversion

Paper: 1MA1/2F				
Question	Answer	Mark	Mark scheme	Additional guidance
24	9.85	M1  A1	for $\sin(38) = \frac{AB}{16}$ oe <b>or</b> alternative method to find $AB$  for an answer in the range 9.76 to 9.92	
25	8.3 and 8.4	B1  B1	for 8.3 in the correct position  for 8.4 in the correct position	Accept 8.3 $\dot{9}$ or 8.399...
26	168	P1  P1  P1  A1	for working with ratio to find the amount for C or D eg. $1.5 \times 2 (=3)$ or (A, B, C, D =) 2, 7, 3, 3 oe <b>OR</b> for suitable expressions linking A with C or D, eg. $A = x, C = 1.5x$  for “2 + 3 + 3 + 7” (=15) <b>OR</b> adds 4 suitable expressions, eg. “ $x + 3.5x + 1.5x + 1.5x$ ” (= 7.5x)  for a complete process to find the amount of money eg. $360 \div “15” \times 7$ <b>OR</b> $360 \div “7.5” \times 3.5$  cao	

Paper: 1MA1/2F					
Question	Answer	Mark	Mark scheme		Additional guidance
27	(a)	$5.62 \times 10^{-3}$	B1	cao	
	(b)	1452	B1	cao	
28	(a)	24, 39	B1	cao	SC: B1 for 3, 5, 8 seen if M0 scored
	(b)	$8a$	M1 A1	for a complete method to find the next 2 terms, eg. $a + 2a (= 3a)$ <b>and</b> $2a + "3a" (= 5a)$ $8a$ oe	
29	$\begin{pmatrix} -2 \\ 1 \end{pmatrix}$	M1  A1	for $4 - 2 \times 3 (= -2)$ or $5 - 2 \times 2 (= 1)$ seen as a calculation  <b>OR</b> for $\begin{pmatrix} 4 \\ 5 \end{pmatrix} - \begin{pmatrix} 2 \times 3 \\ 2 \times 2 \end{pmatrix}$  <b>OR</b> for $\begin{pmatrix} -2 \\ b \end{pmatrix}$ where $b \neq 1$ or $\begin{pmatrix} a \\ 1 \end{pmatrix}$ where $a \neq -2$  cao		May be in a column vector



## Modifications to the mark scheme for Modified Large Print (MLP) papers: 1MA1 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:  $\pm 5^\circ$

Measurements of length:  $\pm 5$  mm

PAPER: 1MA1/2F		
Question	Modification	Mark scheme notes
2	Wording 'five' added.	Standard mark scheme
8	(a) Change $a$ and $b$ to $m$ and $n$ - MLP and Braille.	Standard mark scheme but $a$ and $b$ changed to $m$ and $n$ .
8	(c) Braille only: change $e$ and $f$ to $r$ and $s$ .	Standard mark scheme but $e$ and $f$ changed to $r$ and $s$ .
9	Diagram enlarged. Key moved above the diagram. Circles divided into four sections. Wording 'incomplete' added.	Standard mark scheme
10	Symbols removed from the frame and enlarged. Boxes enlarged.	Standard mark scheme
11	Question wording changed to 'Work out the value of $P$ when $r = 5$ and $q = -4$ given that $P = 7r + 3q$ .'	Standard mark scheme
13	Diagram enlarged. Width label moved to the left-hand side of the diagram. Length and width lines changed to dashed lines. Shading changed to dotted shading. Wording 'shaded' added. Grid lines added.	Standard mark scheme

PAPER: 1MA1/2F		
Question	Modification	Mark scheme notes
15	Diagram enlarged. Label moved to the left-hand side of the diagram.	Standard mark scheme
19	Diagram kept the same size. Scale moved above the diagram.	Standard mark scheme
20	(b) Diagram enlarged. Wording 'below' removed.	Standard mark scheme
21	Diagram enlarged. Wording 'below' removed.	Standard mark scheme
23	Diagram enlarged. Wording changed to 'It shows a container in the shape of a cuboid with length 30 cm, width 6 cm and height 19 cm.' Second 19 cm label added on the left of the diagram. Dashed line and 'Water' added.	Standard mark scheme
24	Diagram enlarged. Angle moved outside of the angle arc and the angle arc made smaller. Wording added: 'AC = 16 cm Angle ACB = 38° Angle ABC is a right angle.'	Standard mark scheme
28	(b) Braille only: ' <i>a</i> ' changed to ' <i>m</i> '.	Standard mark scheme but <i>a</i> changed to <i>m</i> for Braille.



