Mark Scheme (Results)

November 2020

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

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November 2020
Publications Code 1MA1_2F_2011_MS

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 (eg 3.5 – 4.2) then this is inclusive of the end points (eg 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 eg 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 eg "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 eg [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	$\frac{37}{100}$	B1	or any other equivalent fraction	
2	29 000	B1	cao	
3	6*e*	B1		
4	25	B1	cao	
5	27	B1	cao	
6	Yes with supporting calculations	M1	for ONE correct time conversion seen or used eg 105 (mins) is 1 (hr) 45 (mins) **or** 16 45 – 14 30 = 2 hr 15 mins **or** 14 30 + 1 (hr) + 45(mins)	May be implied by a correct calculation 1 hr = 60 mins is not enough for this mark
		M1	for a full method to make a comparison eg for adding 20 and 105 to 14 30 (=16 35) **or** for subtracting 20 and 105 from 16 45 (=14 40) **or** for finding the time differences eg 16 45 – 14 30 (= 2 hr 15 mins) and 105 + 20 (=125 mins) **or** adding 105 to 14:30 (= 16 15) **and** 1645 – "16 15" (=30)	Intention to do the correct calculation or calculations is enough for this mark Accept any sensible time notation throughout (pm is not required)
		C1	correct conclusion from the comparison of accurate figure(s) eg Yes and 16 35 or 4.35(pm) 14 40 or 2.40(pm) **or** for 2 hours 5 minutes and 2 hours 15 minutes oe **or** for 10 minutes spare **or** 30 (minutes to get to the bus stop)	Yes may be implied by a statement

Paper: 1MA1/2F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
7	Two reasons	C2 (C1	for two correct reasons for one correct reason) **Acceptable examples** No label for mark The vertical axis jumps from 0 to 71 The bars are not all the same width Toms bar is twice as wide as the others No axes Toms bar should not take up 4 squares Toms bar shaded 2 not 1 block Tom has 2 bars shaded but the others only have one bar shaded It is not labelled Tom has gone over 2 squares Toms bar is bigger than the others Toms bar is not correct The numbering is not correct **Not acceptable examples** There is no title Different sized gaps between the bars The bars are not symmetrical The bars are not the same size	Allow if one reason is fully correct and the other reason is not. For column accept strip, bar, block, line, cubes in an unambiguous explanation

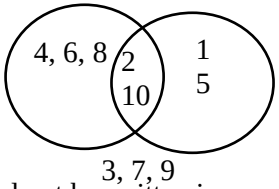
Paper: 1MA1/2F					
Question		**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
8	(a)(i)	30	B1	cao	
	(ii)	Reason	C1	reason, eg angles on a straight line add up to 180°	
	(b)	Explanation	C1	for explanation eg the two angles don't add up to 360 **Acceptable examples** 90 + 280 = 370 The two angles don't add up to 360 280 should be 270 Angles around a point equal 360° It should be 360 (in a circle) It should be 80 It should not be a right angle It cannot be 280° **Not acceptable examples** They don't add up to 180 365 degrees in a circle ⌐ means 90 degrees	
9	(a)	25	B1	for 25, accept answer in range 24 to 26	
	(b)	24	M1	for 40 ÷ 10 × 6	
			A1	cao	
	(c)	Comment	C1	(dep B1 or M1) ft for comment for their results, eg the two answers are quite close **or** answer to (b) is less than answer to (a) **or** the rule gives a smaller answer	
10	(a)	12	B1	cao	
	(b)	4	B1	cao	

Paper: 1MA1/2F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
11	600 cm^3	M1	for a complete method to find the volume eg $4 \times 10 \times 15$	If extra steps are shown do not award this mark
		A1	for 600	Ignore incorrect or absent units for this mark
		B1	(indep) cm^3	Ignore incorrect or absent numerical answer for this mark
12	L23, U23, L29, U29	B2	for all 4 outcomes with no extras or repeats	Pairs must be unambiguous and in the correct order of letter number
		(B1	for at least 2 correct outcomes out of at most 8 different outcomes **or** for indicating 23 and 29 are the only prime numbers between 20 and 30)	
13	19	P1	for $4275 \div 28$ (= 152(.678..)) **or** 153 **or** a build up to at least 150×28 (=4200)	Division may be seen as a build up method
		P1	for "152" × 28 (= 4256) **or** "153" × 28 (=4284) **or** ("152.678.." – 152) (=0.678..) **or** 4275 ÷ "152" – 28(= 0.125) **or** 4275 – "4200" (=75) oe	Use of 150× 28 or better for "4200"
		A1	cao	
14	Correct pie chart	M1	for a method to find at least one angle eg $\frac{50}{(50+45+25)} \times 360$ (= 150) **or** $\frac{45}{(50+45+25)} \times 360$ (= 135) **or** $\frac{25}{(50+45+25)} \times 360$ (= 75) oe	Do not award for drawing if the
		A1	for at all 3 angles correctly calculated **OR** at least one correct and accurately drawn angle (from no more than 3 sectors)	intention is to show more than 3 sectors 3 angles correct in table is enough for this mark irrelevant of diagram
		A1	for a fully correct labelled pie chart	Labels as "City" from table not just angle size.

Paper: 1MA1/2F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
15 (a)	–13	M1	for substitution eg 3 × 5 and 4 × –7 **or** 15 and –28	3 × 5 (= 15) and 4 × –7 (= –28) may be seen separately but both must be seen for the award of M1
		A1	cao	35 and 4–7 do not get the mark unless multiplication is shown eg 35 = 15 is evidence of multiplication and should not be seen as choice
(b)	5	M1	for 38 = 3 × 6 + 4y **or** 38 – 18 (=20) **or** for a complete method to make y the subject eg $y = \frac{T-3x}{4}$	eg $y = (T – 3x) \div 4$
		A1	cao	
16	58	P1	for a correct process to find the pass mark for the exam or either paper eg (60 + 90) ÷ 3 × 2 oe (= 100) **or** 60 ÷ 3 × 2 oe (= 40) **or** 90 ÷ 3 × 2 oe	It is possible to award P0P1 on this question Accept 66% or better used for $\frac{2}{3}$
		P1	for a process to find 70% of 60 eg $\frac{70}{100} \times 60$ oe (= 42)	
		P1	for a complete set of processes to find the required mark "100" – "42"(=58) or "40"+ "60" – "42" (=58)	May be seen in parts
		A1	cao SC B2 for an answer of 48	

Paper: 1MA1/2F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
17 (a)	5	P1	for finding the number of oranges required eg 8 ÷ 2 × 30 (=120) oe **or** for finding the number of oranges left from use of at least 2 boxes eg 24 × 2 – 30 (=18) or 24 × 4 – 90 (=6) **or** finds the correct amount of juice possible from at least two boxes eg 24 + 24 is 2 litres or 24 + 24 + 24 is 4 litres	A build up method with no process shown must use fully correct figures
		P1	for a complete process eg "120" ÷ 24 (=5) oe **or** 30 + 30 + 30 + 30 (=120) **and** 24 + 24 + 24 + 24 + 24 (=120) **or** 24 × 2 − 30 = 18, 18 + 24 = 42, 42 – 30 = 12, 12 + 24 =36, 36 – 30=6, 6 + 24 = 30	May be seen as a mixture of repeated subtraction and addition
		A1	cao with no arithmetic errors seen SCB1 for an answer of 10 supported by working	This mark cannot be awarded if the supporting work has an arithmetic error An answer only and no working is no marks
(b)	9 : 2	M1	for a partially simplified correct ratio eg 126 : 28 or any other equivalent ratio **or** 2 : 9	eg 630:140, 315:70, 63: 14 180:40, 90:20, 45:10, 4.5:1
		A1	cao	
18	Rotation 180º about (−1, 0)	C2	rotation 180° about (−1, 0) **or** enlargement sf −1 centre (−1, 0)	Award no marks if more than one transformation is given
		(C1	rotation 180° **or** rotation about (−1, 0) **OR** enlargement sf −1 **or** enlargement centre (−1, 0))	

Paper: 1MA1/2F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
19	$\frac{3}{10}$	P1	for a process to find three amounts in the correct proportions, eg R = 1, L = 3 × 1 = 3, A = 2 × 3 = 6, **or** R : L : A = $\frac{1}{6}$: 0.5 : 1 oe **or** $L=3R$, $L=\frac{A}{2}$ or $L=3R$, $2L=A$	Relationship could be given in algebraic form or in ratio form, using fractional comparison or using their own figures
		A1	for $\frac{3}{10}$ or equivalent fraction	Award P1 for correct answer not given as a fraction
20	1.75	P1	for an initial process eg 1.80 ÷ 12 (=0.15) or 1.80 ÷ 3 (=0.6)	Accept 1.8 ÷ 12 = 15 (p) They can work in pounds or pence
		P1	for a correct second step eg "0.15" ÷ 3 (=0.05) or "0.6" × 7 (=4.2) or 3÷ "0.15"(=20) or 7 ÷ 3 (=2.3..) or "0.15" × 7 (=1.05)	
		P1	for finding the price of one pen eg-"0.05" × 7 (=0.35) or "4.2" ÷ 12 (=0.35) or 7 ÷ "20"(=0.35) or "2.3.... × "0.15" (=0.35) or "1.05" ÷ 3 (=0.35)	
		A1	cao	
21 (a)	2×2×3×7	M1	for a complete method to find prime factors, could be shown on a factor tree, with no more than one arithmetic error **or** for 2, 2, 3, 7	Condone the use of 1
		A1	for 2 × 2 × 3 × 7 oe	Accept $2^2 \times 3 \times 7$
(b)	420	M1	for at least 3 multiples of both 60 and 84 (can include 60 and 84) **or** finds the prime factors of both 84 (may be seen in (a)) and 60, may be seen in factor trees	60, 120, 180, 240, 300, 360, 420 84, 168, 252, 336, 420 60 = 2 × 2 × 3 × 5 or $2^2 \times 3 \times 5$ If factor tree in (a) is incorrect ft this factor tree in part (b) for M1 only
		A1	420 or 2 × 2 × 3 × 5 × 7 oe	

Paper: 1MA1/2F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
22 (a)	Venn diagram	M1	for correct numbers in at least one region	Ignore all entries except the region you are marking for each method mark
		M1	for correct numbers in at least two regions	
		A1	for all regions correct	
(b)	$\frac{2}{10}$	M1	for $\frac{a}{10}$ where $0 < a < 10$ and a is an integer **or** $\frac{2}{b}$ where $b > 2$ and b is an integer **or** ft diagram	Need not be written in correct form at this stage eg could be a ratio 2 : 10 Repeated digits in the diagram should be counted as 2 elements
		A1	$\frac{2}{10}$ oe or ft diagram	Accept any equivalent fraction, decimal form 0.2 or percentage form 20%
23	No	P1	for 3000 ÷ (2 + 3) (= 600)	
	(supported)	P1	for "600" × 2 (= 1200) **or** "600" × 3 (= 1800) **or** "600" ÷ 6 (= 100) **or** "600" ÷ 20 (= 30)	
		P1	for "1200" ÷ 6 (= 200) **or** "1800" ÷ 20 (= 90) **or** "100" × 2 (= 200) **or** "30" × 3 (= 90)	
		P1	for "90" ÷ ("200" + "90") × 100 (= 31.0...) oe **or** "90" ÷ ("200" + "90") (= 0.31...) **or** 0.3 × ("200" + "90") (= 87)oe	Full method to compare
		C1	correct conclusion **and** fully correct calculations with accurate figure eg No and 87 **or** No and 31% **or** No and 0.31	No may be implied by a statement No working, answer only no marks

Paper: 1MA1/2F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
24 (a)	13, (6), 5, 4, –3	B2 (B1	for all 4 values correct for 2 or 3 correct values)	
(b)	Correct graph	M1 A1	ft (dep on B1) for plotting at least 4 of the points from their table correctly for a fully correct curve drawn	Accept a freehand curve drawn that is not made of line segments Line sections outside the required range can be ignored.
25	99.5	M1 A1	for sin (34) = $\frac{x}{178}$ oe **or** alternative method to find x for answer in range 99.5 to 99.7	 If an answer in the range 99.5 to 99.7 is given in the working space then incorrectly rounded, award full marks
26	$\begin{pmatrix}-9\\14\end{pmatrix}$	M1 A1	for $2\begin{pmatrix}3\\4\end{pmatrix} - 3\begin{pmatrix}5\\-2\end{pmatrix}$ **or** $\begin{pmatrix}6\\8\end{pmatrix}$ **and** $\begin{pmatrix}15\\-6\end{pmatrix}$ **or** $\begin{pmatrix}-9\\y\end{pmatrix}$ **or** $\begin{pmatrix}x\\14\end{pmatrix}$ cao	May be seen in two separate calculations eg 2×3 + –3×5 and 2×4 + –3×–2 Condone incorrect notation if method is clear for this mark only

Paper: 1MA1/2F				
Question	**Answer**	**Mark**	**Mark scheme**	**Additional guidance**
27	35.3	P1 P1 P1 A1	for starting the process to find length of third side of triangle, eg $9^2 - 6^2$ (=45) **or** $6^2 + x^2 = 9^2$ for $\sqrt{9^2 - 6^2}$ or $\sqrt{81-36}$ or $\sqrt{45}$ or $3\sqrt{5}$ (= 6.7..) **or** $r^2 = 45$ for stating or using $\pi \times$ [radius]$^2 \div 4$ for answer in range 35.2 to 35.4	 [radius] is any value If an answer in the range 35.2 to 35.4 is given in the working space then incorrectly rounded, award full marks No working, answer only no marks
28	24	M1 A1	for a complete method eg $360 \div 15$ (=24) cao	If extra steps are shown do not award this mark.
29	2	B1	cao	

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