

Mark scheme for 1MA1 Higher themed papers: Standard Form

GCSE Mathematics (1MA1)

Themed papers – Standard Form

Compiled from student-friendly mark schemes

Please note that this mark scheme is not the one used by examiners for making scripts. It is intended more as a guide to good practice, indicating where marks are given for correct answers. As such, it doesn't show follow-through marks (marks that are awarded despite errors being made) or special cases.

It should also be noted that for many questions, there may be alternative methods of finding correct solutions that are not shown here – they will be covered in the formal mark scheme.

NOTES ON MARKING PRINCIPLES

Guidance on the use of codes within this mark scheme

M1 – method mark. This mark is generally given for an appropriate method in the context of the question. This mark is given for showing your working and may be awarded even if working is incorrect.

P1 – process mark. This mark is generally given for setting up an appropriate process to find a solution in the context of the question.

A1 – accuracy mark. This mark is generally given for a correct answer following correct working.

B1 – working mark. This mark is usually given when working and the answer cannot easily be separated.

C1 – communication mark. This mark is given for explaining your answer or giving a conclusion in context supported by your working.

Some questions require all working to be shown; in such questions, no marks will be given for an answer with no working (even if it is a correct answer).

Question 1 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	5.62×10^{-3}	B1	This mark is given for the correct answer only
(b)	1452	B1	This mark is given for the correct answer only

Question 2 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$0.045 \times 10^3 = 4.5 \times 10^1$ $4.5 \times 10^{-3} = 4.5 \times 10^{-3}$ $450 = 4.5 \times 10^2$ $0.45 \times 10^{-1} = 4.5 \times 10^{-2}$	M1	This mark is given for conversion to same format or three expressions in the correct order
	4.5×10^{-3} , 0.45×10^{-1} , 0.045×10^3 , 450	A1	This mark is given for the correct order only

Question 3 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$\frac{3.9 \times 10^7}{3 \times 10^5}$	P1	This mark is given for a process to find how long the signal took to reach Mars
	$= 1.3 \times 10^2$ $= 130$	A1	This mark is given for finding the number of seconds the signal takes to reach Mars
(b)	The signal will take longer to reach Mars	C1	This mark is given for a correct explanation

Question 4 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$\frac{3.42}{7.5} \times \frac{10^{-7}}{10^{-6}} = 0.456 \times 10^{-1}$	M1	This mark is given for a method to find an answer in standard form
	4.56×10^{-2}	A1	This mark is given for the correct answer only

Question 5 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	36 000	B1	This mark is given for the correct answer only
(b)	$(2.8 \div 4.7) \times 10^{-2-5}$ or $0.5957... \times 10^{-7}$ or $5.957... \times 10^{-8}$ or 0.00000005957...	M1	This mark is given for a method multiply the two terms
	5.96×10^{-8}	A1	This mark is given for the correct answer only

Question 6 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	3.246×10^7	B1	This mark is given for the correct answer only
(b)	0.00496	B1	This mark is given for the correct answer only
(c)	No; <i>B</i> is bigger since the power of 10 is bigger	C1	This mark is given for a correct conclusion with a valid explanation given

Question 7 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$13.8 \times 5.4 \times 10^7 \times 10^{-12}$ $= 74.52 \times 10^{-5}$ $= 7.452 \times 10^{-4}$	1	This mark is given for the digits 7452 seen
	0.000 745 2	1	This mark is given for the correct answer only

Question 8 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	8.623×10^{-5}	B1	This mark is given for the correct answer only
(b)	$\frac{3.2 \times 5.1}{4.3} \times \frac{10^3 \times 10^{-2}}{10^{-4}}$	M1	This mark is given for a method to work out the calculation
	7.44×10^6	A1	This mark is given for the correct answer only

Question 9 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	For digits 1619... or 4.90245×10^{12} or 3.0276×10^{12}	M1	
	1.6	A1	This mark is given for an answer in the range of 16 to 1.62

Question 10 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	Jupiter	B1	This mark is give for the correct answer only
(b)	$4.869 \times 10^{24} - 3.302 \times 10^{23}$ $= 4.5388 \times 10^{24}$	B1	This mark is give for the correct answer only
(c)	$4.35 \times 10^9 \div 4.14 \times 10^7 = 105.07\dots$	M1	This mark is given for a method to compare the distances of Venus and Neptune from Earth
	Yes, Nishat is correct	A1	This mark is given for a correct statement with supporting evidence

Question 11 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	0.00000797	B1	This mark is given for the correct answer only
(b)	$\frac{2.52 \times 10^5}{4 \times 10^{-3}} = \frac{2.52}{4} \times (10^{5-(-3)}) =$ 0.63×10^8	M1	This mark is given for a method to deal with calculations involving powers
	6.3×10^7	A1	This mark is given for the correct answer only in standard form

Question 12 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	104 000	B1	This mark is given for the correct answer only
(b)	6×10^{-2}	A1	This mark is given for the correct answer only
(c)	$300.3 \times 10^6 \div 4.62 \times 10^8$	M1	This mark is given for setting up the correct calculation to divide the cost by the number of tins
	0.65	A1	This mark is given for the correct answer only, or given in standard form (6.5×10^{-1})

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Question 13 (Total 5 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	5.49×10^{-3}	B1	This mark is given for the correct answer only
(b)		M1	for method to square each element, e.g. 64 and $10^{3 \times 2}$ or method to convert to ordinary numbers and square, e.g. 8000×8000
	6.4×10^7	A1	This mark is given for the correct answer only
(c)		M1	for method to convert to ordinary numbers, e.g. $760\,000 + 87\,000$ or $7.6 \times 10^5 + 0.87 \times 10^5$
	8.47×10^5	A1	This mark is given for the correct answer only

Question 14 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$(1.496 \times 10^{11}) \div (3 \times 10^8) (= 498.666\dots)$	M1	This mark is given for a method to find the number of seconds taken for light to reach the earth
	$498.666\dots \div (60 \times 60)$	A1	This mark is given for converting the number of seconds into hours
	$0.1385185185 = 0.139$ to 3 significant figures	A1	This mark is given for showing the answer to be 0.139 hours as required
(b)	For example, Danesh has multiplied the indices rather than adding them	C1	This mark is given for a correct explanation

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Performance data:

Q	Taken from			Total Marks available	TOPIC	Spec Ref	AO	% Mean marks	Edexcel mean averages Marks of candidates who achieved grade:										
	Q	Series	Paper						ALL	9	8	7	6	5	4	3	2	1	U
1a	8a	June 2019	2H	1	Number	N9	1	90	0.90	0.98	0.97	0.95	0.93	0.88	0.77	0.58	-	-	0.39
1b	8b	June 2019	2H	1	Number	N9	1	96	0.96	0.99	0.99	0.98	0.97	0.95	0.90	0.79	-	-	0.67
2	10	Mock Set 2	3H	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3a	11a	June 2019	3H	2	Ratio	N9, R1, R10, R11	3	88	1.75	1.98	1.94	1.89	1.81	1.66	1.42	1.03	-	-	0.64
3b	11b	June 2019	3H	1	Ratio	R10	3	84	0.84	0.98	0.95	0.92	0.87	0.79	0.66	0.45	-	-	0.25
4	7	Nov 2019	2H	2	Number	N9	1	68	1.36	1.89	1.70	1.75	1.65	1.55	1.28	1.05	-	-	0.78
5a	9a	Mock Set 1	2H	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5b	9b	Mock Set 1	2H	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6a	7a	Nov 2019	3H	1	Number	N9	1	67	0.67	1.00	0.97	0.92	0.91	0.80	0.66	0.44	-	-	0.11
6b	7b	Nov 2019	3H	1	Number	N9	1	72	0.72	1.00	0.97	0.96	0.90	0.88	0.73	0.45	-	-	0.23
6c	7c	Nov 2019	3H	1	Number	N9	2	73	0.73	0.89	0.86	0.83	0.80	0.79	0.72	0.69	-	-	0.45
7	7	Nov 2017	3H	2	Number	N9	1	57	1.14	2.00	1.74	1.61	1.63	1.46	1.25	0.97			0.69
8a	7a	Nov 2018	2H	1	Number	N9	1	64	0.64	0.90	0.79	0.92	0.83	0.78	0.64	0.46	-	-	0.30
8b	7b	Nov 2018	2H	2	Number	N9	1	49	0.98	1.80	1.76	1.51	1.40	1.18	0.89	0.68	-	-	0.45
9	9	Mock Set 4	3H	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10a	10a	June 2017	2H	1	Number	N9	1	74	0.74	0.98	0.92	0.85	0.77	0.67	0.53	0.36	-	-	0.21
10b	10b	June 2017	2H	1	Number	N9	1	59	0.59	0.89	0.79	0.68	0.58	0.50	0.40	0.26	-	-	0.14
10c	10c	June 2017	2H	2	Number	N9	2	45	0.90	1.74	1.42	1.09	0.87	0.66	0.42	0.19	-	-	0.06
11a	8a	June 2017	1H	1	Number	N9	1	75	0.75	0.95	0.91	0.85	0.79	0.69	0.53	0.32	-	-	0.15
11b	8b	June 2017	1H	2	Number	N9	1	39	0.78	1.70	1.35	1.03	0.76	0.49	0.25	0.08	-	-	0.02
12a	4a	Mock Set 4	2H	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12b	4b	Mock Set 4	2H	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

12c	4c	Mock Set 4	2H	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13a	7a	Mock Set 3	1H	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13b	7b	Mock Set 3	1H	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13c	7c	Mock Set 3	1H	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14a	7a	Mock Set 2	2H	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14b	7b	Mock Set 2	2H	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				42					14.45	20.67	19.03	17.74	16.47	14.73	12.05	8.80			5.54