GCSE Mathematics (1MA1)

Themed papers – Mean

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 6 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$2 \div 40 \times 100$	B1	This mark is given for reading 2 students from the 20 to 24 bar
	5	A1	This mark is given for a correct answer only
(b)	11, 8, 13, 6 and 2	M1	This mark is given for frequencies of 11, 8, 13, 6 and 2 used
	$11 \times 2 + 8 \times 7 + 13 \times 12 + 6 \times 17 + 2 \times 22$ $= 380$	M1	This mark is given for totalling frequencies multiplied by correct mid-interval terms 2, 7, 12, 17 and 22
	$\frac{380}{40}$	M1	This mark is for dividing by the number of students
	9.5	C1	This mark is given for a correct estimate supported by correct working

Question 2 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	30×60 (= 1800) 20×54 (= 1080)	P1	This mark is given for a process to find the **total** mark of the whole class and the **total** mark of the girls
	(1800 – 1080) = 720	P1	This mark is given for a process to find the **total** mark of the boys
	$720 \div 10 = 72$	A1	This mark is given for the correct answer only

Question 3 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$(1 \times 7.5) + (2 \times 12.5) + (7 \times 17.5) + (8 \times 22.5)$ $= 7.5 + 25 + 122.5 + 180$	M1	This mark is given for a method to find four products within the intervals
	$\frac{335}{18}$	M1	This mark is for a method to find $\sum ft \div 18$
	18.6	A1	This mark is given for a correct answer in the range 18.61 to 18.62

Question 4 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$4 \times 5 = 20$ kg $5 \times 9 = 45$ kg	P1	This mark is given for a process to find the weight of the red bricks or the blue bricks
	$20 + 45 + 6 = 71$ kg	P1	This mark is given for a process to find the weight of all the bricks
	Average weight of bricks is $\frac{71}{10}$ = 7.1 kg so Donna is incorrect	C1	This mark is given for finding the average weights of the bricks with a correct conclusion stated

Question 5 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$30 \times 14 = 420$ $18 \times 10 = 180$	C1	This mark is given for a method to find total number of counters in all bags and boxes and the total number of counters in the bags
	$420 – 180 = 240$	C1	This mark is given for a method to find the total number of counters in the boxes
	The mean number of counters per box is $240 \div 12 = 20$, so Mark is wrong	C1	This mark is given for a complete solution

Question 6 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$15.6 \times 10 = 156$ $9.2 \times 10 = 92$ $11.2 \times 40 = 448$	P1	This mark is given for a process to find total scores of either women, children or all people
	$(448 – 156 – 92) \div 20$	P1	This mark is given for a complete process to find average score of men
	10	A1	This mark is given for the correct answer only
	The mean is reduced (since the total is reduced but the number of men stays the same)	C1	This mark is given for a correct reason

Question 7 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$30 \times 32.85 = 985.5)$ **or** $11 \times 31.9 = 350.9$	P1	This mark is given for a start to the process
	$985.5 – 350.9 \div 19$	P1	This mark is given for a complete process to find the mean
	33.4	A1	This mark is given for a correct answer only

Question 8 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$\pi \times 80 = 251.327…$	1	This mark is given for finding the length of the circumference of the circle
	$251.327 \div 8 = 31.4…$	1	This mark is given for the correct answer only
(b)	No, the mean distance stays the same because the total distance and the number of points stays the same	1	This mark is given for a correct comment

Question 9 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	200 + 3300 + 2000 + 0 + 1800 = 7300	1	This mark is given for fx with x consistent within intervals
	7300 ÷ 20	1	This mark is given $\Sigma fx \div \Sigma f$
	365	1	This mark is given for the correct answer only
(b)	Yes, since outliers can affect the mean	1	This mark is given for a correct comment

Mark scheme for 1MA1 Higher themed papers: Mean

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	4a	Nov 2018	3H	2	Ratio	R9	2	70	1.4	2	2	1.8	1.8	1.75	1.47	0.94	-	-	0.49
1b	4b	Nov 2018	3H	4	Statistics	S2, S4	2	33	1.3	4	3.76	2.74	2.16	1.51	1.12	0.61	-	-	0.39
2	7	June 2017	1H	3	Statistics	S4	3	54	1.61	2.93	2.67	2.18	1.65	1.1	0.55	0.17	-	-	0.06
3	4	Nov 2019	3H	3	Statistics	S4	1	40	1.20	3.00	2.59	2.21	1.84	1.42	0.99	0.62	-	-	0.22
4	6	Nov 2019	1H	3	Statistics	S4	3	29	0.86	2.67	2.7	2.06	1.62	1.03	0.55	0.25	-	-	0.04
5	12	Mock Set 2	1H	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6a	8a	Mock Set 3	1H	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6b	8b	Mock Set 3	1H	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	12	Mock Set 4	3H	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8a	3a	Nov 2017	2H	2	Geometry	G17	1	28	0.57	1.75	1.5	1.6	1.37	1	0.59	0.29	-	-	0.12
8b	3b	Nov 2017	2H	1	Statistics	S4	3	26	0.26	0.75	0.71	0.49	0.52	0.31	0.26	0.2	-	-	0.14
9a	5a	Nov 2017	1H	3	Statistics	S4	1	20	0.59	2.50	2.24	1.75	1.23	0.90	0.63	0.36	-	-	0.16
9b	5b	Nov 2017	1H	1	Statistics	S4	3	2	0.02	0.25	0.18	0.11	0.06	0.03	0.02	0.01	-	-	0.01
				32					**7.81**	**19.85**	**18.35**	**14.94**	**12.25**	**9.05**	**6.18**	**3.45**	**-**	**-**	**1.63**