Mark scheme for 1MA1 Higher themed papers: Statistical Diagrams: Cumulative Frequency

GCSE Mathematics (1MA1)

Themed papers – Statistical Diagrams: Cumulative Frequency

Compiled from student-friendly mark schemes

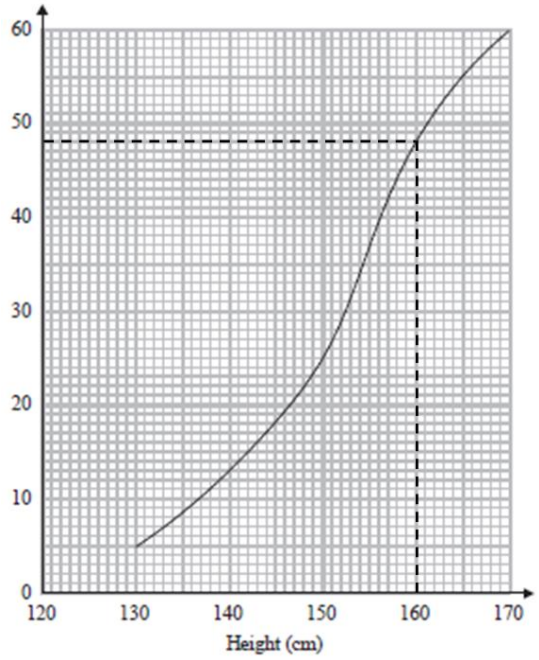
Please note that this mark scheme is not the one used by examiners for making scripts. It is intended more as a guide to good practice, indicating where marks are given for correct answers. As such, it doesn't show follow-through marks (marks that are awarded despite errors being made) or special cases.

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.

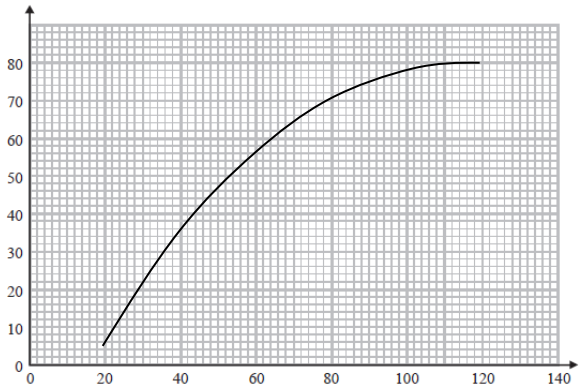
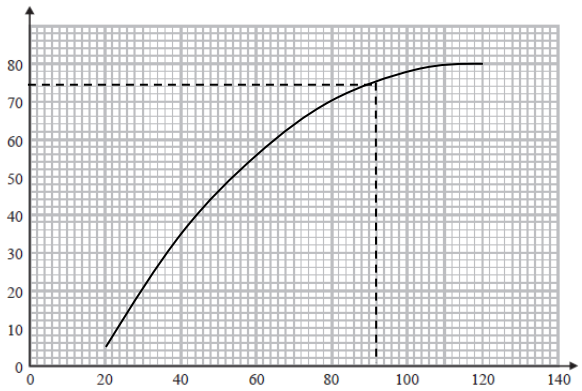
NOTES ON MARKING PRINCIPLES

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).

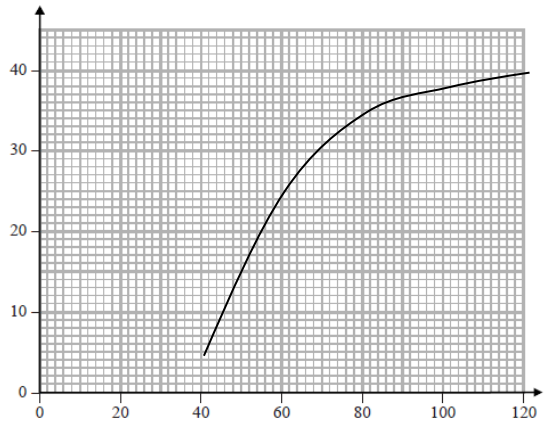
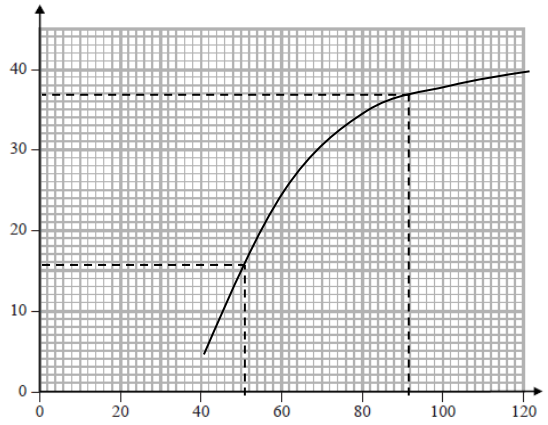
Question 1 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
		M1	This mark is given for a line drawn on the graph from h = 160 to cf = 48
	60 – 48 = 12	A1	This mark is given for a correct answer (in the range 11.8 to 12.2)

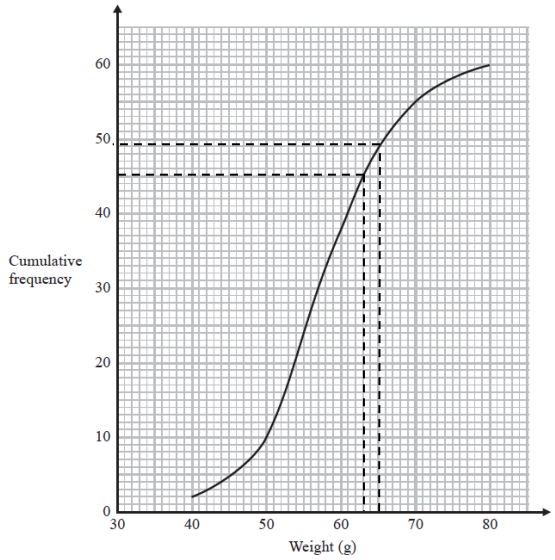
Question 2 (Total 6 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	5, 35, 55, 70, 78, 80	M1	This mark is given for correctly completing the table
(b)		M1	This mark is given for 5 or 6 points plotted correctly
		A1	This mark is given for a fully correct curve
(c)		M1	This mark is given for a method to read off the graph at 90 minutes to find 74
	(80 – 74) = 6	M1	This mark is given for finding the number of office workers who take more than 90 minutes to get to work
	$\frac{6}{80} = 7.5$	A1	This mark is given for any correct answer in the range 5–10

Question 3 (Total 6 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)		C2	These marks are given for a correct cumulative frequency graph through (40, 5), (60, 25), (80, 35), (100, 38) and (120, 40) (C1 is given for at least 4 points plotted)
(b)	Upper quartile = 68 Lower quartile = 44	M1	This mark s given for an upper or lower quartile identified (±2)
	68 – 44 = 24	A1	This mark is given for an answer in the range 20 to 28
(c)		M1	This mark is given for a method to find the difference between readings taken from the readings of points from a mark of 50 and a mark of 90
	$\frac{37-16}{40} = \frac{21}{40}$	A1	This mark is given for a correct answer in the range $\frac{19}{40}$ to $\frac{23}{40}$

Question 4 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	57	1	This mark is given for the correct answer only
(b)	Not necessarily, since the maximum weight might be less than 80 and the minimum weight less than 40	1	This mark is given for a correct explanation
(c)		1	This mark is given for reading the graph at weight 65 (=49) and at cumulative frequency 45 (= 63)
	25% of 60 would be 15 potatoes, but only 11 have a weight of 65g (so less than 25%)	1	This mark is given for a correct explanation

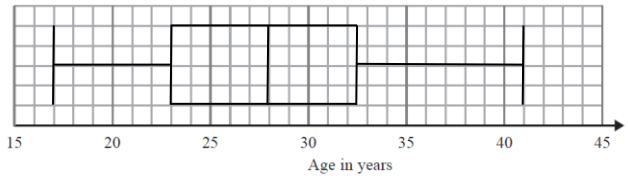
Question 5 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	A & **Y**, **B** & **X**, **C** & **Z**, **D** & **W**	B2	Two marks are given for all four correct pairs (B1 is given for two or three correct pairs)

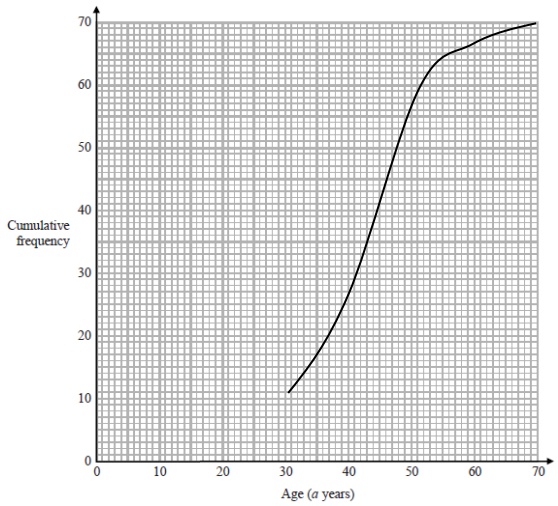
Question 6 (Total 5 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)		B1	This mark is given for at least 5 of the points plotted correctly
	6 points plotted consistently within each interval on graph	B1	This mark is given for a fully correct cumulative frequency graph
(b)	$0.25 \times 80 = 20$	M1	This mark is given for a method to find 25% of the total days
		M1	This mark is given for reading from the graph from 60
	Answer in the range 37 – 39	A1	This mark is given for a correct estimate in the range 37 to 39 (which agrees with the graph drawn)

Question 7 (Total 6 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)(i)		B1	This mark is given for a box drawn with at least two correct values from LQ = 23, Median = 28, UQ = 32.5
		B1	This mark is given for the lowest value (17) and the highest value (41) shown on the grid
		B1	This mark is given for a fully correct diagram
(a)(ii)	$\frac{a}{25}$, $a < 25$ or $\frac{10}{b}$, $10 < b \leq 25$	M1	This mark is given for a correct denominator 25 or a correct numerator between 10 and 25
	$\frac{10}{25}$	A1	This mark is given for the correct answer only
(b)	The class intervals are incorrect (they should be $0 < a \leq 30, 40, 50$)	C1	This mark is given for a correct reason

Question 8 (Total 6 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)		B1	This mark is given for at least 4 points plotted correctly (30, 10), (40, 26), (50, 58), (60, 66), (70, 70)
		B1	This mark is given for points joined by a curve (though accept straight lines)
(b)	43	B1	This mark is given for an answer in the range 41–45
(c)	15 people aged less than 35 years 7 people aged more than 55 years	M1	This mark is given for taking readings at 35 and 55 years
	63 – 15 = 48 people 60% of 70 people = 42 people	M1	This mark is given for working out the number of people between 35 and 55 years old
	Yes, Francesco is correct	C1	This mark is given for a correct conclusion supported by working

Question 9 (Total 6 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	Taking a reading form the graph to find 53	M1	This mark is given for a reading from the graph at time = 40 minutes
	7	A1	This mark is given for a correct answer only
(b)	He is wrong because he needs to read a value from the graph at cf = 15	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
1	8	June 2017	2H	2	Statistics	S3	2	81	1.62	1.93	1.86	1.74	1.63	1.52	1.39	1.18	-	-	0.90
2a	11a	June 2019	2H	1	Statistics	S3	1	83	0.83	1.00	0.99	0.96	0.88	0.75	0.54	0.33	-	-	0.19
2b	11b	June 2019	2H	2	Statistics	S3	2	67	1.34	1.92	1.80	1.62	1.37	1.08	0.73	0.46	-	-	0.27
2c	11c	June 2019	2H	3	Ratio	S3, R9	3	57	1.71	2.84	2.66	2.28	1.74	1.13	0.54	0.20	-	-	0.09
3a	10a	Nov 2019	1H	2	Statistics	S3	2	41	0.82	1.78	1.51	1.29	1.04	0.79	0.76	0.61	-	-	0.53
3b	10b	Nov 2019	1H	2	Statistics	S4	2	14	0.28	1.67	1.14	0.92	0.61	0.26	0.15	0.03	-	-	0.01
3c	10c	Nov 2019	1H	2	Statistics	S3, P3	2	12	0.24	1.00	1.14	0.75	0.45	0.22	0.14	0.05	-	-	0.01
4a	11a	Nov 2017	3H	1	Statistics	S3, S4	2	39	0.39	0.88	0.71	0.69	0.64	0.56	0.42	0.32	-	-	0.15
4b	11b	Nov 2017	3H	1	Statistics	S3, S4	2	1	0.01	0.12	0.06	0.00	0.01	0.01	0.01	0.01	-	-	0.01
4c	11c	Nov 2017	3H	2	Statistics	S3	2	35	0.70	1.75	1.47	1.20	1.30	0.99	0.77	0.51	-	-	0.27
5	11	Mock Set 1	1H	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6a	11a	Mock Set 2	1H	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6b	11b	Mock Set 2	1H	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7ai	9ai	Mock Set 3	1H	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7aii	9aii	Mock Set 3	1H	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7b	9b	Mock Set 3	1H	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8a	9a	Mock Set 3	3H	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8b	9b	Mock Set 3	3H	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8c	9c	Mock Set 3	3H	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9a	10a	Mock Set 4	3H	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9b	10b	Mock Set 4	3H	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				40					**7.94**	**14.89**	**13.34**	**11.45**	**9.67**	**7.31**	**5.45**	**3.7**	**-**	**-**	**2.43**