

GCSE Mathematics (1MA1)

Themed papers – Compound Interest

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 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	Personal bank: $0.02 \times 25000 = 500$ Secure bank: $0.043 \times 25000 = 1075$	P1	This mark is given for a process to work out the interest given by each bank after one year
	Personal bank: $25000 \times 1.02 \times 1.02 \times 1.02 = 26530.20$ Secure bank: $25000 \times 1.043 \times 1.009 \times 1.009 = 26546.46$	P1	This mark is given for a process to find value of £25000 after 3 years in each bank
	Secure Bank will give Ami the best interest at the end of 3 years	C1	This mark is given for a conclusion supported by correct working

Question 2 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$200\,000 \times 1.015 = 203\,000$	M1	This mark is given for a method to show the amount that will be in the savings account after one year
	$200\,000 \times (1.015)^4 = 212\,272.71$	M1	This mark is given for a method to show the amount that will be in the savings account after four years
	$212\,272.71 - 200\,000 = 12\,272.71$	A1	This mark is given for a correct answer (in the range 12 272.70 to 12 272.72)

Question 3 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$12336 \div 12000 = 1.028$	P1	This mark is given for the start of a process to find interest rate for year 1
	$1.028 - 1 \times 100 = 2.8\%$	P1	This mark is given for a complete process to find the interest rate for year 1
	$\frac{2.8}{2} \div 100 \times 12336 = 172.70$	P1	This mark is given for a complete process to find the value of the interest in year 2
	$12336 + 172.70 = 12.508.70$	A1	This mark is given for the correct answer only

Question 4 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$\frac{28.80}{20} \times 100 = 144$	P1	This mark is given for a process to find the amount of interest added before tax
	$\frac{144}{8000} \times 100$	P1	This mark is given for a process to find the interest rate
	1.8	A1	This mark is given for the correct answer only

Question 5 (Total 3 marks)

Part	Working an or answer examiner might expect to see	Mark	Notes
	$3550 \times (1.026)^2 = 3737.00$	P1	This mark is given for a process to find the amount in the savings account after two years
	$\frac{3819.21 - 3737}{3737}$	P1	This mark is given for a process to find the value of R
	2.2	A1	This mark is given for the correct answer only

Question 6 (Total 5 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$2000 \times (1.025)^3 = 2153.78$	P1	This mark is for showing how much money Ali has at the end of 3 years
	$1600 \times (1.035)^3 = 1773.95$	P1	This mark is for showing how much money Ben has at the end of 3 years
	Ali gets $2153.78 - 2000 = 153.78$ Ben gets $1773.95 - 1600 = 173.95$	P1	This mark is for calculating the amount of interest Ali and Ben get
	Ben gets the most interest after 3 years	C1	This mark is given for a correct conclusion supported by correct working
(b)	No; a rise would increase the interest gained by Ben (which is already greater than that gained by Ali)	C1	This mark is given for a correct explanation

Question 7 (Total 5 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	10625 9031.25 7676.5625 6525.078125 5546.316406	1	This mark is given for evaluating $(0.85)^n$ for at least one value of n
	5	1	This mark is given for the correct answer only
(b)	$79.20 \div 0.6 = 132$	1	This mark is given for finding the amount of interest before tax is deducted
	$(132 \div 5500) \times 100$	1	This mark is given for a method to find R
	2.4	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
	$0.5 = \left(1 - \frac{x}{100}\right)^8$ or $0.5 = r^8$	M1	This mark is given for a method to determine an equation to solve the problem
	$r = \sqrt[8]{0.5} = 0.917(\dots)$	M1	This mark is given for a method to solve the equation found
	$x = 1 - 0.917 = 0.083$ $= 8.3\%$	A1	This mark is given for an answer in the range 8.29 – 8.3

Question 9 (Total 5 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	N: 13995×0.88 or L: 14495×0.87	P1	This mark is given for a process to find the value of one car at the end of one year
	N: $13995 \times (0.88)^3$ or L: $14495 \times (0.87)^3$	P1	This mark is given for a process to find the value of one car at the end of 3 years
	N: $13995 \times (0.88)^3 (= 9537.2006)$ L: $14495 \times (0.87)^3 (= 9545.0005)$	P1	This mark is given for a complete process to find the value of both cars at the end of 3 years
	N: £9537.20 L: £9545.00 Lauren's car will have the greater value	C1	This mark is given for a correct conclusion supported by working shown
(b)	Natasha's car will be worth less	C1	This mark is given for an appropriate explanation

Mark scheme for 1MA1 Higher themed papers: Compound interest

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	6	June 2017	2H	3	Ratio	R16	3	79	2.38	2.88	2.79	2.68	2.52	2.27	1.77	1.08	-	-	0.57
2	2	June 2019	3H	3	Ratio	R16	1	64	1.93	2.55	2.36	2.19	1.99	1.69	1.28	0.85	-	-	0.53
3	9	June 2018	2H	4	Ratio	R16	3	63	2.52	3.86	3.51	3.08	2.61	2.16	1.45	0.66	-	-	0.23
4	10	June 2019	3H	3	Ratio	R9	3	57	1.70	2.75	2.43	2.08	1.74	1.29	0.74	0.30	-	-	0.13
5	13	Nov 2019	2H	3	Ratio	R9, R16	3	54	1.63	2.89	2.81	2.60	2.34	1.95	1.48	0.85	-	-	0.46
6a	4a	Nov 2018	2H	4	Ratio	R16	3	57	2.28	4.00	3.29	3.47	3.36	2.99	2.27	1.24	-	-	0.73
6b	4b	Nov 2018	2H	1	Ratio	R16	3	25	0.25	0.70	0.50	0.51	0.41	0.36	0.21	0.09	-	-	0.05
7a	9a	Nov 2017	3H	2	Ratio	R16	1	56	1.12	2.00	1.68	1.61	1.69	1.52	1.25	0.92	-	-	0.54
7b	9b	Nov 2017	3H	3	Ratio	R9	3	7	0.22	2.12	1.62	1.14	0.89	0.46	0.11	0.03	-	-	0.00
8	14	Mock Set 1	3H	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9a	9a	Mock Set 2	2H	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9b	9b	Mock Set 2	2H	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				34					14.03	23.75	20.99	19.36	17.55	14.69	10.56	6.02	-	-	3.24