

GCSE Mathematics (1MA1)

Themed papers – Percentage: Increase and Decrease

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
	$\frac{70}{20} = 3.5; \frac{70+10}{20+10} = \frac{80}{30} = 2.67$	P1	This mark is given for a process to calculate the initial or new pressure
	$\frac{3.5 - 2.67}{3.5} \times 100 = 24\%$	P1	For a complete process to find the percentage decrease in pressure
	No; the pressure decreases by 24%, which is greater than 20%	A1	This mark is given for a correct conclusion with correct figures

Question 2 (Total 4 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$\frac{5.6}{1.4^3} = 2.04\dots, \frac{10^{-5}}{(10^{-4})^3} = 10^7$	M1	This mark is given for a method to find a value for T^2
	4.52×10^3	A1	This mark is given for the correct answer only
(b)	$\sqrt{\frac{1.1}{1.05^3}} = 0.97\dots$	M1	This mark is given for a method to find the scale factor of the decrease of T
	The scale factor of the change of T is less than 1, therefore the value of T decreases	C1	This mark is given for a correct explanation supported by correct working

Question 3 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$883 - 245 = 638$	M1	This mark is given for a method to work out the increase in the insurance payment
	$\frac{638}{245} \times 100$	M1	This mark is given for a method to work out the percentage increase
	260.41	A1	This mark is given for a correct answer in the range 260 to 260.5

Question 4 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$5\% = 2.30; 100\% = 20 \times 2.30$	M1	This mark is given for a method to link 5% with 2.30 or $100 \div 5 (= 20)$
	46	A1	This mark is given for a correct answer only

Question 5 (Total 2 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	$0.8 \times 25000 (=20000)$	P1	This mark is given for showing a process to depreciate by 20% This could be shown in several stage eg $25000 - (25000 \times 20 \div 100)$
	$20000 \times 0.88 (= 17600)$ Alternative method could be $20000 - (20000 \times (100 - 12) \div 100)$	P1	This mark is given for showing a process to depreciate by 12% as a second stage.
	15488	A1	This mark is given for a correct answer only

Question 6 (Total 5 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$6.5 \times 10^7 \times 1.006^4$	M1	This mark is given for a method to find an estimate for the population in 2020
	6.66×10^7	A1	This mark is given for a correct answer only
(b)	Growth is calculated using a compound calculation, not a simple one	C1	This mark is given for a correct explanation
(c)	Common ratio is $1 + 0.06\%$, so 1.006	M1	This mark is given for a method to find the common ratio
	Terms are generated by multiplying the previous term by 1.006, so a geometric progression is formed	C1	This mark is given for a correct conclusion

Question 7 (Total 3 marks)

Part	Working or answer an examiner might expect to see	Mark	Notes
	Assume 100g of cereal = £1 Jack's idea is to provide 125g for £1 = 20p per 25g	P1	This mark is given for a start to the process
	Sadia's idea must match 20p per 25g so needs to sell for 80p	P1	This mark is given for a complete process to find a solution
	$\frac{100 - 80}{100} = 0.2$ = 20%	A1	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
	$52.00 - 41.60 (= 10.40)$	M1	This method mark is given for finding the total amount of the reduction
	$10.40 \div 52 \times 100$	M1	This method mark is given for a method to find the amount of the reduction as a fraction of the original price
	20 (%)	A1	This accuracy 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
	$293.25 \div 0.85 = 345$	P1	This mark is given for a process to find the price of the TV after the second reduction
	$345 \div 0.75$	P1	This mark is given for a process to find the price of the TV after the second reduction
	460	A1	This mark is given for the correct answer only

Question 10 (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: Percentage: Increase and Decrease

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 2018	2H	3	Ratio	R9/R1 1	3	84	2.51	2.88	2.79	2.72	2.63	2.46	2.1	1.48	-	-	0.85
2a	9a	June 2018	3H	2	Number	N9	1	57	1.15	1.72	1.58	1.43	1.24	0.98	0.64	0.33	-	-	0.14
2b	9b	June 2018	3H	2	Ratio	R9	2	17	0.34	1.03	0.68	0.47	0.3	0.16	0.06	0.01	-	-	0
3	2	Nov 2018	3H	3	Ratio	R9	1	39	1.18	2.6	2.18	1.97	1.72	1.32	1.03	0.87	-	-	0.63
4	5	Mock Set 1	3H	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5	5	Mock Set 4	2H	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6a	10a	Mock Set 3	2H	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6b	10b	Mock Set 3	2H	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6c	10c	Mock Set 3	2H	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	11	Nov 2018	1H	3	Ratio	R3, R9	3	17	0.52	2.8	2.15	1.23	0.87	0.65	0.42	0.19	-	-	0.1
8	12	Mock Set 1	1H	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
9	10	Mock Set 3	3H	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
10a	9a	Mock Set 2	2H	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
10b	9b	Mock Set 2	2H	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
				34					5.7	11.03	9.38	7.82	6.76	5.57	4.25	2.88	-	-	1.72