



GCSE MATHEMATICS

Higher tier

Algebra

Topic test – Sequences

Mark Scheme

8300

Version 1.0

Glossary for Mark Schemes

GCSE examinations are marked in such a way as to award positive achievement wherever possible. Thus, for GCSE Mathematics papers, marks are awarded under various categories.

If a student uses a method which is not explicitly covered by the mark scheme the same principles of marking should be applied. Credit should be given to any valid methods. Examiners should seek advice from their senior examiner if in any doubt.

M	Method marks are awarded for a correct method which could lead to a correct answer.
A	Accuracy marks are awarded when following on from a correct method. It is not necessary to always see the method. This can be implied.
B	Marks awarded independent of method.
ft	Follow through marks. Marks awarded for correct working following a mistake in an earlier step.
SC	Special case. Marks awarded within the scheme for a common misinterpretation which has some mathematical worth.
M dep	A method mark dependent on a previous method mark being awarded.
B dep	A mark that can only be awarded if a previous independent mark has been awarded.
oe	Or equivalent. Accept answers that are equivalent. eg accept 0.5 as well as $\frac{1}{2}$
[a, b]	Accept values between <i>a</i> and <i>b</i> inclusive.
3.14 ...	Allow answers which begin 3.14 eg 3.14, 3.142, 3.1416
Use of brackets	It is not necessary to see the bracketed work to award the marks.

Examiners should consistently apply the following principles

Diagrams

Diagrams that have working on them should be treated like normal responses. If a diagram has been written on but the correct response is within the answer space, the work within the answer space should be marked. Working on diagrams that contradicts work within the answer space is not to be considered as choice but as working, and is not, therefore, penalised.

Responses which appear to come from incorrect methods

Whenever there is doubt as to whether a student has used an incorrect method to obtain an answer, as a general principle, the benefit of doubt must be given to the student. In cases where there is no doubt that the answer has come from incorrect working then the student should be penalised.

Questions which ask students to show working

Instructions on marking will be given but usually marks are not awarded to students who show no working.

Questions which do not ask students to show working

As a general principle, a correct response is awarded full marks.

Misread or miscopy

Students often copy values from a question incorrectly. If the examiner thinks that the student has made a genuine misread, then only the accuracy marks (A or B marks), up to a maximum of 2 marks are penalised. The method marks can still be awarded.

Further work

Once the correct answer has been seen, further working may be ignored unless it goes on to contradict the correct answer.

Choice

When a choice of answers and/or methods is given, mark each attempt. If both methods are valid then M marks can be awarded but any incorrect answer or method would result in marks being lost.

Work not replaced

Erased or crossed out work that is still legible should be marked.

Work replaced

Erased or crossed out work that has been replaced is not awarded marks.

Premature approximation

Rounding off too early can lead to inaccuracy in the final answer. This should be penalised by 1 mark unless instructed otherwise.

Q	Answer	Mark	Comments
1(a)	Add 6	B1	
1(b)	-7	B1	
2(a)	2, 5, 8	B1	
2(b)	$3n - 1 = 101$	M1	may be implied by final answer
	34	A1	
3	All 5 correct	B4	B3 for 4 correct B2 for 3 correct B1 for 1 or 2 correct
	Additional Guidance		
	Two connections from a LH box is choice so is incorrect for that box		
	Connections do not have to be straight lines		B4

Q	Answer	Mark	Comments
4	First term 3 and Third term 27	B2	B1 for one correct. or first term 3^1 or third term 3^3 or first term -3 and third term -27
	Additional Guidance		
	If answer lines are blank, mark progression first and then working lines		
	Correct answer for 1st term or 3rd term in the progression, but incorrect numerical term on answer line		B0 for that term
	Correct answer for 1st term or 3rd term in the progression, with non-contradictory algebraic term on answer line		B1 for that term
	Correct answers for 1st term and 3rd term in the progression, with non-contradictory algebraic terms on answer lines		B2
5	Two terms from the sequence $10n + 1$ ie two from 11, 21, 31, 41, ...	B2	B1 one correct term or lists at least the first three terms from both sequences ie 5, 7, 9, ... and 1, 6, 11, ...
6(a)	$a \times 1 + b = a + b$ and $b \times 1 + a = a + b$	B1	
6(b)	$2a + b$ or $3b + a$	M1	
	$2a + b = 3b + a$ so $a = 2b$	A1	

Q	Answer	Mark	Comments
---	--------	------	----------

7	Alternative method 1		
	$d = \frac{82-46}{12}$ or $d = \frac{36}{12}$ or $d = 12$	M1	Any letter for d not a or b
	$2b = 12$	M1dep	
	$b = 6$	A1	
	$b = 6$ and $a = -2$	A1	
	Alternative method 2		
	(5th term \Rightarrow) $a + 8b + 2b + b + 2b$ or (5th term \Rightarrow) $a + 14b$	M1	
	$a + 8b = 46$ and $a + 14b = 82$	M1dep	oe correct simultaneous equations.
	$b = 6$ or $a = -2$	A1	
	$b = 6$ and $a = -2$	A1	
	Additional Guidance		
	Correct substitution without writing simultaneous equations scores the first two marks on alt 1	M1M1	

Q	Answer	Mark	Comments
8	$\frac{2(2-4)}{\sqrt{5}}$ or $\frac{3(3-4)}{\sqrt{6}}$ or $\frac{-4}{\sqrt{5}}$ or $\frac{-3}{\sqrt{6}}$	M1	
	$\frac{-4}{\sqrt{5}}$ and $\frac{-3}{\sqrt{6}}$ or $\frac{-4\sqrt{5}}{5}$ and $\frac{-3\sqrt{6}}{6}$	M1	
	$\frac{-8\sqrt{5}-5\sqrt{6}}{10}$	A1	oe eg $\frac{-24\sqrt{5}-15\sqrt{6}}{30}$
	Additional Guidance		
	$\frac{n^2-4n}{\sqrt{n+3}}$ with no correct substitution		M0M0A0

9	Alternative method 1		
	$250 \times 2 (= 500)$	M1	
	Their $500 \div 4 = 125$	M1dep	NB 125 seen with incorrect working such as $250 \div 2$ is M0
	126	A1	
	Alternative method 2		
	$2n$ identified from table or working	B1	
	$2n - 2$	B1dep	
	126	A1	126 with none or no incorrect working is 3 marks.

Copyright information

AQA retains the copyright on all its publications. However, registered schools/colleges for AQA are permitted to copy material from this booklet for their own internal use, with the following important exception: AQA cannot give permission to schools/colleges to photocopy any material that is acknowledged to a third party even for internal use within the centre. Copyright © 2022 AQA and its licensors. All rights reserved.