



GCSE Mathematics

Grades 1-2 Resource Non-Calc Test 2

Mark scheme

8300 Grades 1-2 Resource Non-Calc Test 2

Version: 1.0

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

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 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 a and b inclusive.
[a, b)	Accept values $a \leq \text{value} < b$
3.14 ...	Accept 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.

Continental notation

Accept a comma used instead of a decimal point (for example, in measurements or currency), provided that it is clear to the examiner that the student intended it to be a decimal point.

Question	Answer	Mark	Comments
1	$100 - (65 + 19)$ or $100 - 84$	M1	oe
	16	A1	
	Additional Guidance		
	Embedded answer eg $84 + 16 = 100$		M1A0
2	30	B1	
3	4.5×7 or 45×7 or digits 315	M1	oe
	31.5(0) or $31\frac{1}{2}$	A1	
4	(A =) 26	B1	may be implied by correct answer
	(B =) 10	B1	may be implied by correct answer
	260	B1ft	ft their A $\times$ their B if at least B1 awarded SC2 400 or 52 SC1 55
	Additional Guidance		
	SC2 400 from $A = 40$ and $B = 10$		
	SC2 52 from $A = 26$ and $B = 2$		
	SC1 55 from $8 \times 3 + 2 \times 21 - (15 - 4)$		
	Answer 260 with no incorrect values seen for A and B		B1B1B1
5	$\frac{18}{5}$	B1	

Question	Answer	Mark	Comments
6	Alternative method 1 – working in £		
	Any correct conversion from pence to pounds	B1	may be seen at any stage
	$0.49 \times \frac{400}{100}$ or 0.49×4 or $0.14 \times \frac{250}{100}$ or 0.14×2.5	M1	
	1.96 or 0.35	A1	
	2.31	A1	
	Alternative method 2 – working in pence		
	$49 \times \frac{400}{100}$ or 49×4 or $14 \times \frac{250}{100}$ or 14×2.5	M1	
	196 or 35	A1	
	231	A1	
	2.31	B1ft	ft their 231 correctly converted to £
	Additional Guidance		
	Reward correct work seen amongst multiple attempts Use the scheme that gives the better mark		
	Condone p after their final answer eg £2.31p		

Question	Answer	Mark	Comments
7	(R =) 16 (days) or 4 (symbols) or (Sn =) 10 (days) or 2.5 (symbols) or (C =) 18 (days) or 4.5 (symbols) or (total =) 44 (days) or 11 (symbols) or evidence of addition with answer of 11 (symbols) or $55 \div 4$ or 13.75 (symbols)	M1	
	55 – their 16 – their 10 – their 18 or $55 - 44 (= 11)$ or 2 values for Sun and Fog with a total of 11 or their $13.75 - 11$ or 2.75	M1dep	oe at least one of 16, 10, 18 correct may be on diagram
	6 and 5 or Sun = 1 full and 1 half symbol or Fog = 1 full and 1 quarter symbol	A1	either order, may be on diagram
	Sun = 1 full and 1 half symbol and Fog = 1 full and 1 quarter symbol	A1ft	ft their 11 days (must be an odd number) where Sun is one more than Fog
	Additional Guidance		
	Mark intention for drawings, quarter and half symbol any orientation or angle. Must be attempt at correct size		
	11 with no working seen or their symbols totalling 11 quarters		M1M1

Question	Answer	Mark	Comments
8	Alternative method 1		
	$300 \div 10$ or 30	M1	oe
	their 30×6.5 or their $30 \times 6 + \text{their } 30 \div 2$ or $300 - \text{their } 30 \times 3.5$ or $300 - (\text{their } 30 \times 3 + \text{their } 30 \div 2)$	M1dep	oe
	195	A1	SC2 105
	Alternative method 2		
	$300 \div 100$ or 3	M1	oe
	their 3×65 or $300 - \text{their } 3 \times 35$	M1dep	oe
	195	A1	SC2 105
	Alternative method 3		
	Correct method to work out any multiple of 5% of 300 up to 95%	M1	eg $50\% = 300 \div 2$
	Fully correct build-up method to work out 65% of 300	M1dep	eg $300 \div 2 + 3 \times 300 \div 20$ or $150 + 3 \times 15$ (no errors seen)
	195	A1	SC2 105
	Alternative method 4		
	$65 \div 100$ or 0.65 or 65×300 or 19 500	M1	
	$300 \times \frac{65}{100}$ or $300 \times \text{their } 0.65$ or their $19\,500 \div 100$	M1dep	oe
	195	A1	SC2 105
	Additional Guidance is on the following page		

Question	Answer	Mark	Comments
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8 cont	Additional Guidance		
	In Alt 3, either a correct method or a correct value must be seen for the first M1 Note that $300 \times 50\%$ is not allowed as a correct method		
	If Alt 3 is to be used, the percentage that is attempted must be stated eg $20\% = 300 \div 5$		
	Do not ignore further working for the A mark eg $300 - 195$		M1M1A0

9	Alternative method 1		
	$3x = 19 + 8$ or $3x = 27$ or $(19 + 8) \div 3$ or $\frac{27}{3}$	M1	accept in 'flow chart' eg $(x \rightarrow) \times 3 \rightarrow -8 \rightarrow 19$ and $\leftarrow \div 3 \leftarrow +8 \leftarrow 19$ enough for M1
	9	A1	
	Alternative method 2		
	$x - \frac{8}{3} = \frac{19}{3}$	M1	
	9	A1	
	Additional Guidance		
	$3 \times 9 - 8 (= 19)$		M1A0

Question	Answer	Mark	Comments
10	Alternative method 1		
	15×8 or 120	M1	
	$500 - \text{their } 120$ or 380	M1dep	
	their $380 \div 30$ or 12(...)	M1dep	oe builds up in 30s to at least their $380 - 30$ or builds up in 30s from their 120 to at least 470 allow one error in any build up method
	their 12×30 or 360 or their 12 chosen from a build up	M1dep	oe their 12 must either come from rounding down their 12(...) or from choosing their 12 out of a build up or because they had an exact answer of their 12 from a correct method for the third mark
	their $380 - \text{their } 360$ or 20 or $500 - (\text{their } 360 + \text{their } 120)$ or their $360 + 8 + 8$ (their correct number of 8s) or 376 or their $360 + \text{their } 120 + 8 + 8$ (their correct number of 8s) or 496	M1dep	their 20 must be $0 < \text{their } 20 < 30$
	17 pencils, 12 rulers	A1	

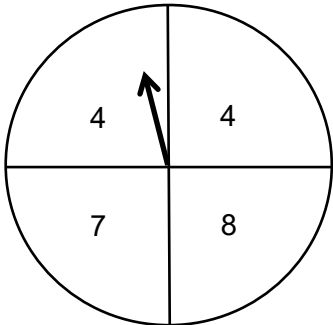
Question	Answer	Mark	Comments
10 cont	Alternative method 2		
	15×0.08 or $1.2(0)$	M1	
	$5 - \text{their } 1.2(0)$ or $3.8(0)$	M1dep	
	$\text{their } 3.8(0) \div (0).3(0)$ or $12(\dots)$	M1dep	oe builds up in $(0).3(0)$ s to at least their $3.8(0) - 30$ allow one error or builds up in $(0).3(0)$ s from their $1.2(0)$ to at least $4.7(0)$ allow one error
	their $12 \times 0.3(0)$ or $3.6(0)$ or their 12 chosen from a build up	M1dep	dep on previous mark their 12 must either come from rounding down their $12(\dots)$ or from choosing their 12 out of a build up or because they had an exact answer of their 12 from a correct method for the third mark
	their $3.8(0) - \text{their } 3.6(0)$ or $(0).2(0)$ or $5 - (\text{their } 3.6(0) + \text{their } 1.2(0))$ or their $3.6(0) + (0).08 + (0).08$ (their correct number of $(0).08$ s) or 3.76 or their $3.6(0) + \text{their } 1.2(0) + (0).08 + (0).08$ (their correct number of $(0).08$ s) or 4.96	M1dep	their 0.20 must be $0 < \text{their } 0.20 < 0.30$
	17 pencils, 12 rulers	A1	
Additional Guidance			
Do not allow mixed units in working unless recovered			
For build-up, one arithmetic mistake counts as one error, even though more than one value may be affected eg, 30, 60, 90, 130, 160, 190, 220, 250, 280, 310, 340, 370 gets 3rd mark in alternative method 1 (error from 90 to 130, but 30 then added correctly throughout)			
If there is no change possible, or change is not considered after rulers are bought, maximum M4			
Example $15 \times 8 = 120$ $500 - 120 = 360$ $360 \div 30 = 12$ then 12 chosen as number of rulers but no further work (4 th mark awarded despite no “remainder” but 5 th mark has to consider change)			M1M1 M1M1 MOA0
Example $15 \times 8 = 120$ $500 - 120 = 380$ $380 \div 30 = 9.2$ and 9 chosen as the number of rulers (no further work)			M1M1 M1M1A OA0

Question	Answer	Mark	Comments
11	(green in A =) $28 \div 2$ or 14 or (red in B =) $20 \div 5 \times 3$ or 12 or (total in A =) $28 \times \frac{3}{2}$ or (total in B =) $20 \times \frac{8}{5}$	M1	oe
	14 and 12 or (total in A =) 42 or (total in B =) 32 or (total green =) 34 or (total red =) 40	A1	may be implied by final answer
	74	A1	SC2 116 (using 56 green discs in A) or 26 (green in A + red in B)
	Additional Guidance		
	14 + 28 + 15 = 57 (implied correct interim total for Bag A)		M1A1A0
	14 + 28 + 15 + 20 = 77 (implied correct interim total for Bag A)		M1A1A0
	14 and 15, with 77 on answer line (implied correct interim total for Bag A)		M1A1A0
12	14 + 28 + 15 + 20, no answer (no implied correct interim total)		M1A0A0
	7 cm by 3 cm rectangle drawn	B1	
	Additional Guidance		
	Mark intention		
	Allow a 7 cm by 3 cm rectangle drawn that does not use the given side		

Question	Answer	Mark	Comments
13	15	B1	
14	[68, 72]	B1	
	Additional Guidance		
	Check diagram for working but answer line takes precedence		
15	2000	B1	
16a	Orders the numbers to at least the sixth number from either end 1 2 2 3 4 5 (... ..) or 8 6 5 5 5 4 (... ..) or 4 and 5 indicated or $\frac{4+5}{2}$	M1	(... ..) 5 4 3 2 2 1 or (... ..) 4 5 5 5 6 8
	4.5 with no errors in working	A1	oe eg $4\frac{1}{2}$
	Additional Guidance		
	4/5		M1A0
	4,5 (cannot accept as 4.5)		M1A0
	Allow 4 and 5 to be the only ones not crossed out as '4 and 5 indicated'		M1
	eg 1 2 2 3 4 5 5 6 6 8 and answer 4.5 (error in ordering)		M1A0
	eg 1 2 3 3 4 5 5 5 6 8 and answer 4.5 (error in ordering)		M1A0
	Ignore any + signs between ordered values unless the total is then calculated <u>and used</u> in this part		

Question	Answer	Mark	Comments
16b	$(5 + 6 + 1 + 3 + 5 + 5 + 8 + 4 + 2 + 2) \div 10$ or $41 \div 10$	M1	Allow one value omitted or incorrect if method clear
	4.1 or $4\frac{1}{10}$	A1	
	Additional Guidance		
	Answer of 4 with correct working or 4.1 seen		M1A1
	Answer of 4 without correct working and without 4.1 seen		M0A0
	Condone missing first and/or final bracket for M1		
	If their total is not 41, all additions must be shown or implied eg they write $5 + \dots + 2 = 42$ and $42 \div 10$ eg they write $5 + 6 + 1 + \text{etc} = 24$ and $24 \div 10$ (both clearly implying that they are adding up all the numbers – minimum is two of the values shown as being added) but, for example, $42 \div 10$ (no other working)		M1A0 M0
	Method mark could be scored for work at top of page, <u>above</u> , but not in, part (a) It cannot be assumed that work done in part (a) is intended for part (b)		
	Answer of $\frac{41}{10}$ or $\frac{4.1}{1}$ or 4 r(emainder) 1		M1A0
17	20	B1	allow $P = 20$

Question	Answer	Mark	Comments																								
18	Any two of 60, 50 and 100	M1	$\frac{60 \times 50}{100}$ 60 and 50 may be implied by 3000																								
	30	A1																									
	Additional Guidance																										
	30 with no working		M0A0																								
	28.1... (from original values) and then rounded to 30		M0A0																								
19a	All values correct	B2	B1 one correct row or one correct column																								
	Additional Guidance																										
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1	2	2	3	5																							
2	0	0	3	5																							
4	4	4	4	5																							
6	6	6	6	6																							
19b	$\frac{5}{16}$	B1ft	oe fraction, decimal or percentage ft their table if at least 8 values																								
	Additional Guidance																										
	Answer must match their table, if table blank, accept $\frac{5}{16}$ (oe) for B1																										
	5 out of 16, 5 in 16, 5 : 16		B0																								
	$\frac{5}{16}$ (matches their table) = $\frac{1}{4}$		B1ft (ignore further work)																								

Question	Answer	Mark	Comments
19(c)		B2	numbers can be in any section if the spinner is blank, mark the top row of table, where the numbers <u>must</u> be in the order 4 4 7 8 for B2 B1 for any two or three correct numbers on spinner or, if spinner is blank, in the correct position in the table
			Additional Guidance
			Ignore any other values written in table
			Spinner takes precedence over table eg top row of table is 4 4 7 8 spinner is 2 3 5 8
			B0