



GCSE Mathematics

Grades 1-2 Resource Calc Test 2

Mark scheme

8300 Grades 1-2 Resource 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	Alternative method 1		
	2 + 6 + 9 or 17 (2008) or 5 + 8 + 3 or 16 (2012)	M1	oe
	17 and 16	A1	
	Alternative method 2		
	2 – 5 + 6 – 8 + 9 – 3 or –3 – 2 + 6 or 5 – 2 + 8 – 6 + 3 – 9 or 3 + 2 – 6	M1	oe eg 3 more gold, 2 more silver, 6 fewer bronze
	Indication that there was 1 more medal in 2008	A1	oe indication there was 1 less in 2012
	Additional Guidance		
	17 must not be linked with 2012, 16 must not be linked with 2008		
	Ignore further work after correct answer seen		
2	2049	B1	
3	$15^2 - 2 \times 63$ or 225 or 126	M1	–126 implies M1
	99	A1	

Question	Answer	Mark	Comments
4	Alternative method 1		
	8.8(0) ÷ 11 or (0).8(0) or 880 ÷ 11 or 80	M1	oe 8.8(0) × 14 or 123.2(0) or 880 × 14 or 12320
	their (0).8(0) × 3 (+ 8.8(0)) or 2.4(0) (+ 8.8(0)) or their 80 × 3 (+ 880) or 240 (+ 880) or their (0).8(0) × 14 or their 80 × 14 or 11.2 or 1120	M1dep	oe their 123.2(0) ÷ 11 or their 12320 ÷ 11
	11.20	A1	Condone (£)11.20p
	Alternative method 2		
	11 ÷ 8.8(0) or 1.25 or 11 ÷ 880 or 0.0125	M1	oe
	14 ÷ their 1.25 or 14 ÷ their 0.0125 or 11.2 or 1120	M1dep	oe
	11.20	A1	Condone (£)11.20p
	Additional Guidance		
	$8.8(0) \times \frac{14}{11}$ or $8.8(0) \times 1.27(\dots)$	M1M1	
	$\frac{56}{5}$ is oe for 11.2	M1M1	
	$\frac{4}{5}$ is oe for 0.8, $\frac{5}{4}$ is oe for 1.25, $\frac{1}{80}$ is oe for 0.0125	M1	

Question	Answer	Mark	Comments
5	$(8 - 5) \times 4$ or 3×4 or 12	M1	oe may be implied
	18 – their 12 or 6	M1	oe $8 \leq \text{their } 12 \leq 16$ may be implied by their correct ft answer
	7 (pm)	A1ft	allow 7.00 (pm) or 19.00 (pm) ft 1 (pm) + their 6 with M0M1 awarded
	Additional Guidance		
	Allow dot, colon, comma, space or no space in time notation		
	18 – 12 = 6, Answer 6 (pm)		M1M1A0
	$4 \times 4 = 16$, $18 - 16 = 2$, Answer 3 (pm)		M0M1A1ft
	$3 \times 5 = 15$, $18 - 15 = 3$, Answer 4 (pm)		M0M1A1ft
	$(5 - 8) \times 4 = 12$ (reverse subtraction recovered and could go on to score up to M1M1A1ft)		
	$(5 - 8) \times 4 = 8$ (reverse subtraction not recovered but could go on to score up to M0M1A1ft)		
6a	118	B1	
6b	55	B1	
7	2 squares shaded	B1	
8	R marked [3.9, 4.1] cm due South of P	B2	B1 for R marked [3.9, 4.1] cm from P or R marked due South of P or 4 (cm) seen

Question	Answer	Mark	Comments
9	$25 \times 10.2(0)$ or 255	M1	oe
	$10 - 7 + 3 - 1$ or $3 + 2$ or 5 or $(10 - 7) \times 11.8(0)$ or $3 \times 11.8(0)$ or 35.4(0) or $(3 - 1) \times 11.8(0)$ or $2 \times 11.8(0)$ or 23.6(0)	M1	oe
	their $5 \times 11.8(0)$ or their $35.4(0) +$ their 23.6(0) or 59	M1dep	oe dep on 2nd M their 35.4(0) and their 23.6(0) must both be from correct methods
	314(.00)	A1	SC2 325.8(0) or 337.6(0)
	Additional Guidance		
	314.0		M3A0
10	$99.2(0) \div 5 \times 24$ or 19.84×24 or $4.8 \times 99.2(0)$ or $2380.8(0) \div 5$ or $\frac{11904}{25}$	M2	oe M1 $99.2(0) \div 5$ or 19.84 oe or $24 \div 5$ or 4.8 oe or $24 \times 99.2(0)$ or 2380.8(0) oe
	476.16	A1	
	Additional Guidance		
	(One year's broadband cost) 238.08 oe implies M1		

Question	Answer	Mark	Comments
11	$496 \div 8$ or 62	M1	oe eg 8×62
	$5 \times$ their 62 or 310	M1dep	oe $496 \times \frac{5}{8}$ is M2
	638 – their 310 or 328 or $(638 - \text{their } 310) \div 2$	M1dep	oe dep on M2
	164	A1	
	Additional Guidance		
	Up to M3 may be awarded for correct work, with no answer or incorrect answer, even if this is seen amongst multiple attempts		
12	Horizontal line from (09.00, 20) to (10.00, 20)	B1	
	Straight line with a negative gradient from their (10.00, 20) to (11.30, 0)	B1ft	ft their (10.00, 20)
	Additional Guidance		
	Tolerance within one small square		
	Accept unruled line if intention for straight line is clear		
	Their (10.00, 20) can be (09.00, 20)		
	Their 10.00 cannot be earlier than 09.00		
13	32	B1	

Q	Answer	Mark	Comments
14	96 in Eat sushi Yes	B1	
	384 in Eat sushi No	B1ft	ft 480 – their 96 if giving a value > 0
	64 in At least once a month Yes	B1ft	ft their $96 \div 3 \times 2$ truncated to the nearest integer or rounded up to the nearest integer
	32 in At least once a month No	B1ft	ft their 96 – their 64 if giving a value > 0 or their $96 \div 3$ truncated to the nearest integer or rounded up to the nearest integer
	Additional Guidance		
	Mark the four given diagram ovals only		
	240 240 160 80		B0B1ft B1ftB1ft
	Follow through values may be rounded up or down to whole numbers provided the total is correct eg 80 400 53 27 (53 is $\frac{2}{3}$ of 80 rounded down)		B0B1ft B1ftB1ft
	Follow through decimal values, withhold first B1, if applicable, at first use of decimal eg1 105.6 374.4 70.4 35.2 (105.6 is incorrect and first use of decimal) eg2 80 400 53.3 26.7 (53.3 is correct ft and first use of decimal) eg3 96 384 63.36 32.64 (63.36 is incorrect and first use of decimal)		B0B1ft B1ftB1ft B0B1ft B0ftB1ft B1B1 B0B1ft
	Correct or ft relative frequencies shown out of 480 seen in appropriate places, withhold first B1 that would have been awarded eg1 $\frac{96}{480} \frac{384}{480} \frac{64}{480} \frac{32}{480}$ eg2 $\frac{45}{480} \frac{435}{480} \frac{30}{480} \frac{15}{480}$ eg3 $\frac{90}{480} \frac{390}{480} \frac{30}{480} \frac{60}{480}$		B0B1 B1B1 B0B0ft B1ftB1ft B0B0ft B0ftB1ft

Question	Answer	Mark	Comments
15	3×18 or 54 or $2 \times 18 + 14$ or 50 or $18 + 3 \times 14$ or 60 or 4×14 or 56 or $1 - 0.25$ or 0.75 seen	M1	oe
	$3 \times 18 \times (1 - 0.25)$ or $3 \times 18 \times 0.75$ or 40.5 or $18 \times (1 - 0.25)$ or 18×0.75 or 13.5(0)	M1dep	oe
	40.50	A1	condone £40.50p
	Additional Guidance		
	40.5 on answer line		M1M1A0

Question	Answer	Mark	Comments
16	Alternative method 1		
	3.2(0) ÷ 5 or 0.64 or 0.29 × 3 or 0.87	M1	oe eg working in pence
	3.2(0) ÷ 5 × 12 + 0.29 × 3 or 7.68 + 0.87	M1dep	oe eg working in pence must be consistent units
	8.55	A1	condone £8.55p
	Alternative method 2		
	12 ÷ 5 or 2.4 or 5 ÷ 12 or 0.41(6...) or 0.417 or 0.42	M1	
	3.2(0) × their 2.4 + 0.29 × 3 or 3.2(0) ÷ their 0.41(6...) + 0.29 × 3	M1dep	oe eg working in pence must be consistent units
	8.55	A1	condone £8.55p
	Additional Guidance		
	Inconsistent units may be recovered in final answer		
	7.68 in working implies M1		
17	0.8	B1	
18	32	B1	

Question	Answer	Mark	Comments
19	Pair of numbers satisfying all criteria	B2	eg $w = 1.9 \quad x = 0.7$ B1 pair of numbers satisfying two criteria eg $w = 1.6 \quad x = 1$ or $w = 2.4 \quad x = 0.2$ or $w = 1.4 \quad x = 0.9$ SC1 pair of numbers with a sum of 2.6 satisfying neither inequality
	Additional Guidance		
	$w = 0.7 \quad x = 1.9$		SC1
20	15	B1	implied by 70 or 345
	(3rd term =) 70	B1ft	ft (their $15 - 1) \times 5$
	Additional Guidance		
	15 70 on answer line		B1B1
	15 and/or 70 seen but not final term eg Answer 345		B1B0
	Answer only 345		B1B0