



GCSE Mathematics

Grades 1-2 Resource Calc Test 1

Mark scheme

8300 Grades 1-2 Resource Calc Test 1

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	$12.5(0) + 12.5(0) \div 2$ or $12.5(0) + 6.25$ or $12.5(0) \times 1.5$ or 18.75	M1	oe Cost of 2 suits
	9.75×4 or $9.75 \times \frac{2}{3} \times 6$ or $6.5(0) \times 6$ or 39(.00)	M1	oe eg $9.75 \times 6 - 9.75 \times 2$ or $58.5(0) - 19.5$ Cost of 6 dresses
	their 18.75 + their 39(.00)	M1dep	dep on at least M1 awarded Must be adding their suit(s) and their dress(es) May be implied by final answer
	57.75	A1	Accept £57.75p
	Additional Guidance		
	$6.25 + 9.75 \times 6$		M0M0M0dep
	$6.25 + 39$		M0M1M1dep
	$12.50 \times 2 + 39$		M0M1M1dep
	$18.75 + 9.75 \times 2$		M1M0M1dep

Question	Answer	Mark	Comments
2	Alternative method 1 Compares cost of 480 bags		
	$480 \div 80$ or 6 or $480 \div 160$ or 3	M1	oe eg $160 + 160 + 160 = 480$ may be implied
	$480 \div 80 \times 1.9(0)$ or $6 \times 1.9(0)$ or $11.4(0)$	M1	oe cost from small packs eg $1.90 \div 80 \times 480$ implies first M
	$480 \div 160 \times 3.25$ or 3×3.25 or 9.75	M1	oe cost from large packs eg $3.25 \div 160 \times 480$ implies first M
	1.65(p)	A1	
	Alternative method 2 Compares cost of 160 bags		
	$160 \div 80 \times 1.9(0)$ or $2 \times 1.9(0)$ or 3.8(0)	M1	oe cost from small packs
	their 3.8(0) – 3.25 or (0).55	M1dep	oe
	$480 \div 160 \times$ their 0.55 or $3 \times$ their 0.55	M1dep	oe
	1.65(p)	A1	
	Alternative method 3 Compares cost of 80 bags		
	$80 \div 160 \times 3.25$ or $3.25 \div 2$ or 1.625	M1	oe cost from large packs eg $\frac{1}{2} \times 3.25$
	$1.9(0) -$ their 1.625 or 0.275	M1dep	oe
	$480 \div 80 \times$ their 0.275 or $6 \times$ their 0.275	M1dep	oe
	1.65(p)	A1	

Question	Answer	Mark	Comments
3	$2x = 27 - 3$ or $2x = 24$ or $\frac{27-3}{2}$ or $\frac{24}{2}$ or $x + 1.5 = 13.5$	M1	oe eg $2x + 3 = 27$ $-3 \quad -3$ or $-2x = 3 - 27$ or $-2x = -24$
	12	A1	
	Additional Guidance		
	Embedded answer with no or incorrect answer eg $2 \times 12 + 3 = 27$ without 12 selected or with incorrect answer		M1A0
	Trial and improvement with answer 12		M1A1
	Trial and improvement with no answer or answer other than 12		M0A0
4	8 in Time exercising Less than 1 hour	B1	
	23 in Exercise taken No	B1	
	58 in Total number of students	B1ft	ft $35 + \text{their } 23$ or $27 + \text{their } 8 + \text{their } 23$
	Additional Guidance		
	8 in Time exercising Less than 1 hour 47 in Exercise taken No 82 in Total number of students		B1 B0 B1ft
	7 in Time exercising Less than 1 hour 25 in Exercise taken No 59 in Total number of students		B0 B0 B1ft
5	$1 : 16$ or $1^2 : 4^2$	B1	oe ratio
	Additional Guidance		
	$1r : 16w$		B0

Question	Answer	Mark	Comments
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6	Alternative method 1									
	Correct reading(s) taken from one or more number(s) of pounds and correct calculation to scale up	M1	eg 1200×5 or $1200 \times 4 + 600 \times 2$							
	6000	A1								
	Alternative method 2									
	$500 \times \frac{720}{\text{their } 60}$ or 500×12	M1	oe							
	6000	A1								
	Additional Guidance									
	Further work eg $1200 \times 5 + 100 \times 5$		M0A0							
For information: <table><tr><td>£100</td><td>1200×5</td></tr><tr><td>£50</td><td>600×10</td></tr><tr><td>£20</td><td>240×25</td></tr><tr><td>£10</td><td>120×50</td></tr></table>		£100	1200×5	£50	600×10	£20	240×25	£10	120×50	M1
£100	1200×5									
£50	600×10									
£20	240×25									
£10	120×50									

7	$(3^6 =) 729$ seen or $(\sqrt{841} =) 29$ seen	M1	
	700	A1	

Question	Answer	Mark	Comments
8	$360 - (21 + 36 + 160 + 90)$ or $360 - 307$ or $270 - (21 + 36 + 160)$ or $270 - 217$	M1	oe
	53	A1	
	Additional Guidance		
	53 (may be on diagram) with no incorrect working or no working		M1A1
	53 on diagram with different answer on answer line		A0
	$360 - (21 + 36 + 160)$ or $360 - 217$ or 143 (ignoring 90°)		M0A0
	$180 - (90 + 36) = 54$		M0A0
9	11	B1	

Question	Answer	Mark	Comments
10	Alternative method 1		
	6×4 or 24 stated or implied as target total of the four cards	M1	Indicating 1, 5, 7 and 11 are the chosen four cards implies M2
	$1 + 5 + 7 + 9 + 11$ or 33	M1	
	9	A1	
	Alternative method 2		
	$1, 5, 7, 9 \rightarrow (1 + 5 + 7 + 9) \div 4$ or $1, 5, 7, 11 \rightarrow (1 + 5 + 7 + 11) \div 4$ or $1, 5, 9, 11 \rightarrow (1 + 5 + 9 + 11) \div 4$ or $1, 7, 9, 11 \rightarrow (1 + 7 + 9 + 11) \div 4$ or $5, 7, 9, 11 \rightarrow (5 + 7 + 9 + 11) \div 4$	M1	$1, 5, 7, 9 \rightarrow 22 \div 4$ or $1, 5, 7, 11 \rightarrow 24 \div 4$ or $1, 5, 9, 11 \rightarrow 26 \div 4$ or $1, 7, 9, 11 \rightarrow 28 \div 4$ or $5, 7, 9, 11 \rightarrow 32 \div 4$
	$1, 5, 7, 9 \rightarrow 5.5$ or $1, 5, 7, 11 \rightarrow 6$ or $1, 5, 9, 11 \rightarrow 6.5$ or $1, 7, 9, 11 \rightarrow 7$ or $5, 7, 9, 11 \rightarrow 8$	A1	
	9	A1	with no error in the mean of 1, 5, 7, 11
	Additional Guidance		
	Use the alternative scheme that awards the better mark		
	33 – 24		M1M1A0
	$1 + 5 + 7 + 11 = 28$, $28 \div 4 = 6$, answer 9 (with no other work)		M1A0A0
11	89 or 98 or 99	B1	condone 8.9 or 9.8 or 9.9
	Additional Guidance		
	Condone eg multiplication signs or 'by' or commas or 'and' eg 8 by 9 or 9×8 or 9×9 or (8, 9) or 9, 8 or 9, 9 or 8 and 9 or 9 and 8 or 9 and 9		B1
	Any evaluation included in the answer must be correct		
	More than one correct answer eg 89 and 98		B1
	Inclusion of an incorrect answer eg 89 and 91		B0

Question	Answer	Mark	Comments
12	$n + 5$ or $5 + n$	B1	oe eg $N - 2 + 7$
	Additional Guidance		
	Letters other than n or N eg $x + 5$		B0
13	$4a + 11$	B2	B1 for each term
	Additional Guidance		
	$4a$ or 11 or $4a + 11$ seen and answer eg $15a$		B1
	$4a + 11$ seen and then 'solves'		B1
	11 and -11 seen (without $4a$ seen)		B0
14	Alternative method 1		
	$18 - 4$ or 14 seen	M1	oe eg $4 + 14 = 18$
	$39 - 2 \times$ their 14 or $39 - 28$ or 11	M1dep	oe eg 14, 14, 11
	15	A1	
	Alternative method 2		
	$39 + 3 \times 4$ or $39 + 12$ or 51	M1	
	their $51 - 2 \times 18$ or their $51 - 36$	M1dep	
	15	A1	
	Additional Guidance		
	14 may be implied by eg twins = 28 (but not just 28 seen)		M1

Question	Answer	Mark	Comments
15	Alternative method 1		
	$24 \div 4 \times 3$ or 18	M1	oe
	their 18×60 or 1080	M1dep	oe 1080 implies M2
	1080 and $\frac{3}{4}$ (of a day)	A1	
	Alternative method 2		
	24×60 or 1440	M1	oe
	their $1440 \div 4 \times 3$ or 1080	M1dep	oe 1080 implies M2
	1080 and $\frac{3}{4}$ (of a day)	A1	
	Alternative method 3		
	$24 \div 4 \times 3$ or 18	M1	oe may be seen in either order (M marks not dependent) [16 h 36 m, 16 h 42 m] implies division 16 or 17 may be embedded
	$1000 \div 60$ or 16(.6...) or 16.7 or 17	M1	
	16(.6...) or 16.7 or 17 or [16 h 36 m, 16 h 42 m] and 18 and $\frac{3}{4}$ (of a day)	A1	16 or 17 may be embedded

Question	Answer	Mark	Comments
15 cont	Alternative method 4		
	24×60 or 1440	M1	oe
	1000 ÷ their 1440 ($\times 100$) or $\frac{25}{36}$ or 0.69... or 69(...)%	M1dep	oe $\frac{25}{36}$ or 0.69... or 69(...)% implies M2
	$\frac{25}{36}$ and $\frac{27}{36}$ and $\frac{3}{4}$ (of a day) or 0.69... and 0.75 and $\frac{3}{4}$ (of a day) or 69(...)% and 75% and $\frac{3}{4}$ (of a day)	A1	
	Additional Guidance		
	Ignore units for the M marks but they must be correct, if given, for the A mark		
	$\frac{3}{4}$ of 24 is insufficient method unless a correct method or 18 is seen		
	Once $1000 \div 60$ or 16 or 16.6... or 16.7 or 17 is seen in Alt method 3, ignore any incorrect conversion to hours and minutes. If the student only shows hours and minutes, they must be in the given range.		
	Do not accept $\frac{3}{4}$ (of a day) in equivalent form eg 1080 or 18		A0

Question	Answer	Mark	Comments
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16	Alternative method 1		
	70×2.2 or 154	M1	
	their $154 \div 14$ or $11 \times 14 = 154$	M1dep	$70 \times 2.2 \div 14$ oe is M1M1dep
	11	A1	
	Alternative method 2		
	$14 \div 2.2$ or 6.36... or 6.4 or $2.2 \div 14$ or 0.157... or 0.16	M1	
	$70 \div$ their 6.36 or $70 \times$ their 0.157 or 11.006... or 10.9375 or 10.99	M1dep	
	11	A1	
	Additional Guidance		
	$14 \div 2.2 = 6.3$ and $70 \div 6.3 = 11.1$	M1M1depA0	
	Only $70 \div 6.3 = 11.1$	M0M0depA0	
	Only $70 \div 6.4 (= 10.9375)$	M1M1depA0	
	eg 10.9375 $\rightarrow$ answer 11	M1M1dep A1	
	Only $70 \div 14$ or 5	M0	
	$70 \div 14 = 5$ and 5×2.2	M1M1dep	
	$70 \times 2.2 = 154$, $154 \div 14 = 11$, 11×70 Answer 770 (11 seen)	M1M1depA0	
	$70 \times 2.2 = 154$, $154 \div 14 \times 70$ Answer 770	M1M0depA0	

Question	Answer	Mark	Comments
17	40	B2	B1 correct proportion seen eg $\frac{10}{25}$ or $\frac{2}{5}$ or 0.4 or $\frac{20}{50}$ or $10 \div 25 \times 100$ oe or correctly evaluates their number of shaded squares $\times 4$ or answer 60
	Additional Guidance		
	$10 \div 25$ or 10 out of 25 in words or ratio used (unless recovered)		B0
	eg $\frac{11}{25}$ seen with answer 44		B1
	eg 7 (shaded) seen with answer 28		B1

Question	Answer	Mark	Comments
18	Alternative method 1 (working in cm)		
	[6.3, 6.7]	B1	implied by 1300
	[2.5, 2.9] and [1.8, 2.2] or [4.5, 4.9]	B1	implied by 540 and 400 implied by 940
	their 6.5×200 or 1300 and their 2.7×200 or 540 and their 2×200 or 400 or their 6.5×200 or 1300 and (their $2.7 + \text{their } 2$) $\times 200$ or 940 or their 6.5×200 or 1300 and their 4.7×200 or 940	M1	oe 1300 and 540 and 400 implies B2M1 1300 and 940 implies B2M1 distances must be exact if measurements not shown if only one value used for BC from the start, their 4.7 must be > 4 and < 6
	their $1300 - \text{their } 540 - \text{their } 400$ or their $1300 - \text{their } 940$	M1dep	oe may be implied by correct answer for their distances their 940 must be > 800 and < 1200
	Correct answer for their 6.5 and their 2.7 and their 2 with all measurements seen or Correct answer for their 6.5 and their 4.7 with all measurements seen	A1ft	ft their measurements their 4.7 must be > 4 and < 6

Question	Answer	Mark	Comments
18 cont	Alternative method 2 (working in cm)		
	[6.3, 6.7]	B1	
	[2.5, 2.9] and [1.8, 2.2] or [4.5, 4.9]	B1	
	their 6.5 – their 2.7 – their 2 or their 6.5 – their 4.7 or 1.8	M1	oe if only one value used for BC from the start, their 4.7 must be > 4 and < 6
	their 1.8×200	M1dep	oe may be implied by correct answer
	Correct answer for their 6.5 and their 2.7 and their 2 with all measurements seen or Correct answer for their 6.5 and their 4.7 with all measurements seen	A1ft	ft their measurements their 4.7 must be > 4 and < 6
	Additional Guidance		
	Allow work in mm but note that they must multiply by 20 for the M1		
	Working may be on diagram		
	Must show measurements to score the A mark and answer must be correct for their original measurements		
	1300 – 940 and answer 360 (no measurements)		B1B1M1M1A0
	1300 – 920 and answer 380 (no measurements)		B1B0M0M0A0
	6.5, 4.6, 1300 – 920 and answer 380		B1B1M1M1A1ft
	6.5, 4.2, 1300 – 840 and answer 460		B1B0M1M1A1ft
	6.5, 2.6, 2 on diagram, 1300 – 5×200 (5 wrong for their values and addition not shown)		B1B1M0M0A0ft

Question	Answer	Mark	Comments
19	Alternative method 1		
	80×0.55 or 44 or 120×0.7 or 84	M1	oe
	$80 \times 0.55 + 120 \times 0.7$ or $44 + 84$ or 128	M1dep	Correct method for both
	$(80 + 120) \times 0.65$ or 130 or their $128 \div (80 + 120) \times 100$ or their $128 \div 2$ or 64	M1	65% of total marks available or their total score for Riya as a percentage of full marks
	128 and 130 and No or 64 and No	A1	oe eg No, she needed 130 but was 2 marks short oe eg 0.64 and 0.65 and No
	Alternative method 2 – marks not scored		
	80×0.45 or 36 or 120×0.3 or 36	M1	oe
	$80 \times 0.45 + 120 \times 0.3$ or $36 + 36$ or 72	M1dep	Correct method for both
	$(80 + 120) \times 0.35$ or 70 or their $72 \div (80 + 120) \times 100$ or their $72 \div 2$	M1	35% of total marks available or their total score for Riya as a percentage of full marks
	72 and 70 and No or 36 and 35 and No	A1	oe eg No, she failed by 2 marks oe eg 0.36 and 0.35 and No

19 cont	Alternative method 3		
	80×0.55 or 44	M1	oe
	$(80 + 120) \times 0.65$ or 130	M1	65% of total marks available
	their 130 – their 44 or 86 and 120×0.7 or 84 or their 130 – their 44 or 86 and their $86 \div 120 \times 100$ or 71.6... or 72	M1dep	dep on M1M1
	86 and 84 and No or 71.6... or 72 and 70 and No	A1	oe eg No, she needed 2 more marks on B oe eg No, she needed 1.6% more on B
	Alternative method 4		
	120×0.7 or 84	M1	oe
	$(80 + 120) \times 0.65$ or 130	M1	65% of total marks available
	their 130 – their 84 or 46 and 80×0.55 or 44 or their 130 – their 84 or 46 and their $46 \div 80 \times 100$ or 57.5	M1dep	dep on M1M1
	46 and 44 and No or 57.5 and 55 and No	A1	oe eg No, she needed 2 more marks on A oe eg No, she needed 2.5% more on A

Additional Guidance continued on the next page

19 cont	Additional Guidance	
	Build up steps for percentages must be correct or have fully correct method shown for any incorrect steps eg1 $50\% = 40$, $5\% = 16$, section A = 56 eg2 $50\% = 40$, $5\% = 80 \times 0.05 = 16$, section A = 56	M0 M1
	Ignore % signs given with marks eg 44%	
	128 and she needs 2 more marks implies No	M1M1M1A1
	$55 + 70 = 125$ $125 \rightarrow 62.5\%$ and No	M0M0 M1A0
	Allow misread of 55% of 120 and 70% of 80 for method marks	max M3