GCSE MATHEMATICS 8300/3F

Foundation Tier Paper 3 Calculator

Mark scheme

June 2025

Version: 1.0 Final

256G8300/3F/MS

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 Examiner.

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.

No student should be disadvantaged on the basis of their gender identity and/or how they refer to the gender identity of others in their exam responses.

A consistent use of 'they/them' as a singular and pronouns beyond 'she/her' or 'he/him' will be credited in exam responses in line with existing mark scheme criteria.

Further copies of this mark scheme are available from aqa.org.uk

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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 $a \leqslant$ 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

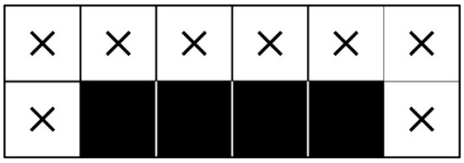
Erased or crossed out work that has been replaced is not awarded marks.

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.

Q	Answer	Mark	Comments
1(a)		B1	
	Additional Guidance		
	Mark intention		
	Condone omission of shading		

Q	Answer	Mark	Comments
1(b)	10	B2	B1 sequence 5, 6, 7, 8, (9) or drawing of pattern 6 SC1 16
	Additional Guidance		
	SC1 is for the total number of squares in pattern 6		
	Mark intention for drawing of pattern 6 for B1		

Q	Answer	Mark	Comments
2(a)	(8, 1)	B1	
	Additional Guidance		
	Check the diagram if answer line is blank		

Q	Answer	Mark	Comments
2(b)	(8, 4)	B1	SC1 (1, 8) in (a) and (4, 8) in (b)
	Additional Guidance		
	Check the diagram if answer line is blank		

Q	Answer	Mark	Comments
3(a)	WC WH WT BC BH BT	B2	any order B1 three or four correct
	Additional Guidance		
	Mark the table unless crossed out and replaced		
	Ignore repeats for B1		
	Accept words		
	Allow WC to be missing or written again if list restarted		

Q	Answer	Mark	Comments
3(b)	$\frac{2}{6}$	B1ft	oe fraction ft their table with max 6 sandwiches from their part (a)
	Additional Guidance		
	Ignore simplification attempts after correct answer		

Q	Answer	Mark	Comments
4(a)	7	B1	
	Additional Guidance		
	If answer line blank check the output oval		

Q	Answer	Mark	Comments
4(b)	$19 + 5$ or 24 or $n \div 3$ or $\frac{x+5}{3}$	M1	oe may be seen on diagram where $14 \leqslant n \leqslant 24$ x can be any letter
	8	A1	
	Additional Guidance		
	$8 \times 3 - 5$ written in working or 8 adjacent to or in the input oval		M1
	$\frac{14}{3}$		M1

Q	Answer	Mark	Comments
4(c)	$\div 6$ or -15 or $\times \frac{1}{6}$ or $+-15$	B1	oe fraction or decimal for $\frac{1}{6}$
	Additional Guidance		
	Mark the rectangle on number machine		
	Divide by 6 or subtract 15 or multiply by $\frac{1}{6}$ or add negative 15		B1
	More than one operation		B0

Q	Answer	Mark	Comments
5(a)	All values correct $\frac{1}{2}$ 0.1 40(%)	B3	oe B2 two values correct B1 one value correct
	Additional Guidance		
	Equivalent answers must be in the correct form		

Q	Answer	Mark	Comments
5(b)	75	B1	

Q	Answer	Mark	Comments
6	Kilometres (km) Centimetres (cm) Metres (m)	B3	B2 two correct B1 one correct
	Additional Guidance		
	centimetres (cm) / metres (m) / kilometres (km) Distance between two villages: ☐ ☐ ✓ Length of a pencil: ✓ ☐ ☐ Height of a building: ☐ ✓ ☐		B3
	Accept any indication, but if a tick and a cross are used in the same row, mark the tick		
	A row with more than one tick is incorrect for that row		

Q	Answer	Mark	Comments
7(a)	11×24 or $764 - 500$ or 264	M1	oe
	$11 \times 24 + 500 = 764$ or $(764 - 500) \div 11 = 24$ or $(764 - 500) \div 24 = 11$ or $764 - 500 = 264$ and $11 \times 24 = 264$	A1	oe eg $11 \times 24 = 264$ and $264 + 500 = 764$
	Additional Guidance		
	Condone $11 \times 24 = 264 + 500 = 764$		M1A1
	Condone 11×24 and $264 + 500 = 764$		M1A1
	$264 + 500 = 764$ without 11×24		M1A0

Q	Answer	Mark	Comments
7(b)	**Alternative method 1: total price**		
	35 × 0.1 × 24 or 84 or 35 × 0.9 × 24 or 756	M2	oe eg 35 × 24 – 35 × 0.1 × 24 M1 35 × 24 or 840 oe or 35 × 0.1 or 3.5(0) oe or 35 × 0.9 or 31.5(0) oe or 24 × 0.1 or 2.4 oe or 24 × 0.9 or 21.6 oe
	756 and Plan B	A1	
	Alternative method 2: monthly price		
	764 ÷ 24 or 31.8(…)	M1	oe
	35 × 0.9 or 31.5(0)	M1	oe
	31.8(…) and 31.5(0) and Plan B	A1	
	Additional Guidance		
	Ignore further working after correct answer		

Q	Answer	Mark	Comments
8	2 × 3.8(0) or 7.6(0)	M1	oe accept working in pounds or pence
	15.85 – their 7.6(0) or 8.25	M1dep	oe accept working in pounds or pence
	2.75	A1	SC2 275
	Additional Guidance		
	Condone £2.75p		
	7.60 – 15.85 unless recovered		M1M0dep

Q	Answer	Mark	Comments
9(a)	4 and 9 in correct positions	B3	B2 9 in smallest position and 4 in largest position or only 4 in correct position or only 9 in correct position or 4^2 in smallest position and 9^2 in largest position or 16 or $\sqrt{16}$ in smallest position and 81 or $\sqrt{81}$ in largest position B1 4^2 or 16 or $\sqrt{16}$ or 9^2 or 81 or $\sqrt{81}$
	Additional Guidance		
	$4^2 = 16$ in smallest position and $9^2 = 81$ in largest position		B2
	16, 4 in smallest position and 81, 9 in largest position		B2
	$2^2 = 4$ in smallest position is not 4 in smallest position $3^2 = 9$ in largest position is not 9 in largest position		

Q	Answer	Mark	Comments
9(b)	0.8^2 ticked with either 0.64 and 0.512 or $\frac{64}{100}$ and $\frac{64}{125}$ or $0.8 < 1$ or suitable worded reason	B1	oe in comparable form fractions must have same numerator or same denominator eg multiplying by decimals below 1 makes numbers smaller
	Additional Guidance		
	Ignore further work after correct values in comparable form		
	Condone 0.51 for 0.512		
	$\frac{16}{25}$ and $\frac{64}{125}$ (fractions do not have same numerator or denominator)		B0
	0.8^2 ticked and squaring makes numbers bigger		B0

Q	Answer	Mark	Comments
10(a)	Answer £2 and £2, £2, 50p, 5p, 1p	B2	any order B1 Answer £2 or a set of coins which total £4.56 or correct modal value for their set of coins SC1 Answer 2 and 2, 2, 50, 5, 1 or Answer 2 and 2, 2, 0.50, 0.05, 0.01
	Additional Guidance		
	SC1 is for an otherwise correct response with all or some units missing eg Answer 2 and £2, 2, 50p, 5, 1		SC1
	Units must be seen on answer and all coins for B2		
	Units must be seen for B1 on answer £2 or on all coins for a set of coins which total £4.56 or on answer and all coins for the correct modal value for their set of coins		
	Accept £0.50, condone £0.50p		
	Units of the form 0.50p are incorrect		
	Use of one or more coins that do not exist is max B1 for Answer £2		
	Answer £2 and 2, 2, 50, 5, 1		B1
	2, 2, 50, 5, 1 without answer £2		B0
	£1, £1, £1, £1, 50p, 5p, 1p		B1
	Answer 1 and 1, 1, 1, 1, 50, 5, 1		B0

Q	Answer	Mark	Comments
10(b)	ordered list 4 5 8 9 16 or ordered list with an extra number (extra may be correct or incorrect) or indication of middle numbers as 6 and 8	M1	list in ascending or descending order
	6	A1	
	Additional Guidance		
	M1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	4 5 7 8 9 16 (ordered list with incorrect extra)		M1
	4 5 8 9 16 1 (ordered list with incorrect extra)		M1
	4 5 6 8 9 16 (ordered list with correct extra) and answer 7		M1A0

Q	Answer	Mark	Comments
11	0.7 × 6 × 20 or 84 or 1.7 × 6 × 20	M2	oe M1 6 × 20 or 120 oe or 0.7 × 6 or 4.2 oe or 0.7 × 20 or 14 oe or 1.7 × 6 or 10.2 oe or 1.7 × 20 or 34 oe
	204	A1	SC2 200 or 220
	Additional Guidance		
	SC2 is from working with 10 or 11 as a whole number of plates per table		

Q	Answer	Mark	Comments
12	Two mistakes from • Incorrect line of best fit • Incorrect plotted value (4, 20 000) • Incorrect y-axis values	B2	B1 one correct mistake
	Additional Guidance		
	Accept a correct line of best fit drawn on the diagram		B1
	Accept point correctly plotted on diagram (4, 19 000)		B1
	The line is wrong (condone)		B1
	Line does not go through the middle of the points (condone)		B1
	The line of best fit isn't going through the points		B1
	Point at 19 000 is wrong		B1
	Values go up differently on the vertical scale		B1
	The line of best fit isn't going through any points		B0
	One of the points is wrong		B0
	Values on the axis are wrong		B0

Q	Answer	Mark	Comments
13	3×5 or 15	M1	oe
	$4 \times 4 \div 2$ or 8	M1	oe
	15 : 8	A1	oe ratio ignore any units
	Additional Guidance		
	Ignore attempts to simplify after correct answer seen		
	8 : 15 unless from incorrect working		M1M1A0
	$5 + 3 = 8$ or $4 + 4 = 8$		M0

Q	Answer	Mark	Comments
14(a)	1 – (0.1 + 0.24) or 0.66 or 0.33	M1	oe percentages or fractions
	0.33 and 0.33	A1	oe percentages or fractions

Q	Answer	Mark	Comments
14(b)	600 × 0.24 or 144 or 1 – 0.24 or 0.76 or 0.1 + their 0.33 + their 0.33	M1	oe their 0.33 from the table 0 < their 0.33 < 1
	600 – their 144 or 600 × their 0.76 or 600 × 0.1 + 600 × their 0.33 + 600 × their 0.33	M1dep	oe
	456	A1ft	ft their 0.33
	Additional Guidance		
	their 0.33 are their two values for P(green) and P(yellow) from the table		
	ft their 0.33 eg P(green) = 0.4 and P(yellow) = 0.2 0.7 × 600 = 420		M1M1A1ft

<table>
<tr><th>Q</th><th>Answer</th><th>Mark</th><th>Comments</th></tr>
<tr><td rowspan="6">15</td><td>Always congruent
Sometimes congruent
Never congruent</td><td>B3</td><td>B2 two correct
B1 one correct</td></tr>
<tr><td colspan="3">Additional Guidance</td></tr>
<tr><td colspan="2"><table>
<tr><th></th><th>Always congruent</th><th>Sometimes congruent</th><th>Never congruent</th></tr>
<tr><td>A’s sides are the same lengths as B’s sides</td><td>✓</td><td></td><td></td></tr>
<tr><td>A’s angles are the same as B’s angles</td><td></td><td>✓</td><td></td></tr>
<tr><td>A is an enlargement of B with scale factor 2</td><td></td><td></td><td>✓</td></tr>
</table></td><td>B3</td></tr>
<tr><td colspan="2">Allow any indication, but if a tick and a cross are used in the same row, mark the tick</td><td></td></tr>
<tr><td colspan="2">A row with more than one tick is incorrect for that row</td><td></td></tr>
</table>

Q	Answer	Mark	Comments
16	$6x - 8 = 2x + 12$	M1	oe equation in terms of x any letter
	$6x - 2x = 12 + 8$ or $-8 - 12 = 2x - 6x$ or $4x = 20$ or $(x =)\ 5$	M1dep	oe collection of terms eg $4x - 20 = 0$
	6 × their 5 – 8 or 2 × their 5 + 12 or 22	M1dep	a combination of sides may be used eg 14 × 5 – 4 or 10 × 5 + 16
	66	A1	
	Additional Guidance		
	5 or 22 may be shown on diagram		
	Trial and improvement with 22 selected as length of side		M3
	Trial and improvement with 5 selected as value of x		M2
	$8x + 4 = 180$ and $x = 22$		M0

Q	Answer	Mark	Comments
17(a)	0.75×80 or 60	M1	oe implied by 132
	0.66 or $\frac{132}{200}$ or $\frac{66}{100}$ or $\frac{33}{50}$	A1	oe fraction, decimal or percentage
	Additional Guidance		
	Ignore simplification or conversion attempts after correct answer		
	60 from $\frac{72}{120} = 0.60$	M0	
	$\frac{80}{120} = 0.66$	M0	

Q	Answer	Mark	Comments
17(b)	Ticks All 200 throws and valid reason	B1	eg ticks All 200 throws and more throws
	Additional Guidance		
	Valid reason with non-contradictory work	B1	
	No box ticked but clear indication of correct box stated in working lines or implied within valid reason	B1	
	Incorrect box ticked	B0	
	Examples of valid reasons 200 is the most Bigger number of trials (gives a more accurate result) Both sets of results is more More data Shows us how much they both got (referring to both people) How many times it landed for both (referring to both people) Better result by adding (implies better is more) **Examples of invalid reasons** More possibility it will land on heads Amount of heads out of 200 More accurate		

Q	Answer	Mark	Comments
18	**Alternative method 1: proportion using angles**		
	$\frac{132}{180}$ or [0.73, 0.7$\dot{3}$] or $\frac{132}{360}$ or [0.36, 0.37] or $\frac{48}{180}$ or [0.26, 0.27] or $\frac{48}{360}$ or [0.13, 0.1$\dot{3}$] or 132 : 48 or 11 : 4	M1	oe fraction or percentage oe either order
	or $\frac{132}{180} \times 30$ or $\frac{48}{180} \times 30$ or 8 or 22 : 8 or 8 : 22 (not oe)	M1dep	oe eg [0.73, 0.7$\dot{3}$] × 30 $\frac{132}{360} \times 30 \times 2$ or $\frac{48}{360} \times 30 \times 2$ is M2
	22	A1	SC1 11
	Alternative method 2: using the number of degrees per match		
	(360 – 132 – 48) ÷ 30 or 180 ÷ 30 or 360 ÷ (30 × 2) or 6	M1	oe
	132 ÷ their 6 or 48 ÷ their 6 or 8	M1dep	oe $\frac{132}{360 \div (30 \times 2)}$ or $\frac{48}{360 \div (30 \times 2)}$ is M2
	22	A1	SC1 11

The mark scheme for Question 18 continues on the next page

Q	Answer	Mark	Comments
18 cont	**Alternative method 3: using the number of matches per degree**		
	$\frac{30}{180}$ or $\frac{30\times2}{360}$ or [0.16, 0.17]	M1	oe fraction or percentage eg $\frac{1}{6}$
	or $\frac{30}{180}\times132$ or $\frac{30}{180}\times48$ or 8	M1dep	oe eg [0.16, 0.17] × 132
	22	A1	SC1 11
	Additional Guidance		
	SC1 is for using 30 matches in total		
	0.17 × 132 = 22.44 with answer 22		M1M1A0
	30 ÷ 2 = 15 and 15 ÷ 2 = 7.5 and 15 + 7.5 = 22.5 with answer 22		M1M1A1
	30 ÷ 2 = 15 and 15 ÷ 2 = 7.5 and 15 + 7.5 = 22.5		M0
	30 ÷ 2 = 15 and 15 ÷ 2 = 7.5 and 7.5 → 8		M1M1
	360 ÷ 30 = 12		M0

Q	Answer	Mark	Comments
19(a)	[5.3, 5.7]	B1	oe eg 5 and a half may be seen on diagram
	$\frac{\text{their } [5.3, 5.7] \times 200\,000}{100 \times 1000}$	M2	oe M1 correct step using one operator eg1 their [5.3, 5.7] × 200 000 eg2 their [5.3, 5.7] ÷ 100 eg3 200 000 ÷ 1000 eg4 100 × 1000 their [5.3, 5.7] < 10 [1 060 000, 1 140 000] implies B1M1
	[10.6, 11.4]	A1	implies B1
	Additional Guidance		
	Answer 10.8 without [5.3, 5.7]		B1M2A1

Q	Answer	Mark	Comments
19(b)	135(°)	B1	

Q	Answer	Mark	Comments
20	$(18-6)\div 3$ or 4	M1	oe implied by 10 and 14
	$4n-2$	A2	oe A1 for $4n+c$ oe
	Additional Guidance		
	Condone use of N or other variables		
	Condone $n=4n-2$		M1A2
	$4n+-2$		M1A1
	$4n$ may be seen as $4\times n$ or $n\times 4$ or $n4$ for M1A1 but not M1A2		
	$n+4$		M1A0

Q	Answer	Mark	Comments
21	**Alternative method 1: works with the amount first**		
	280 ÷ 2 × 3 or 420	M1	oe
	their 420 ÷ 12 × 5	M1dep	oe eg 35 × 5 their 420 cannot be 280
	175	A1	SC2 77.77 or 77.78
	Alternative method 2: works with the ratio first		
	$\frac{2}{3}\times 12$ or 8	M1	oe may be embedded in a ratio
	280 ÷ their 8 × 5	M1dep	oe eg 35 × 5
	175	A1	SC2 77.77 or 77.78
	Additional Guidance		
	Up to M2 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	SC2 is for using $\frac{2}{3}$ of Cat's amount		
	5 : 12 : 8 in any order		M1

Q	Answer	Mark	Comments
22	$2 \times (30 + 20)$ or 100 or $20 + 30 - 6$ or $50 - 6$ or $x + 6 = 50$	M1	oe oe equation
	44	A1	may be seen in correct position on diagram
	Additional Guidance		
	M1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		

Q	Answer	Mark	Comments
23	12^2 or 13^2	M1	oe 144 or 169 implied by 313 or $\sqrt{313}$ or [17.6, 17.7]
	$13^2 - 12^2$ or $169 - 144$ or 25 or $\sqrt{13^2 - 12^2}$ or $\sqrt{169 - 144}$ or $\sqrt{25}$ or 5	M1dep	oe 5 may be in correct position on the diagram
	$9^2 + (\text{their } 5)^2$ or $81 + \text{their } 25$ or 106 or $\sqrt{9^2 + (\text{their } 5)^2}$ or $\sqrt{81 + \text{their } 25}$ or $\sqrt{106}$ or [10.2, 10.3]	M1dep	oe their 5 or their 25 must be from correct working
	$9^2 + 5^2 = 106$ and $\sqrt{106}$ and [10.2, 10.3] or $\sqrt{9^2 + 5^2}$ and [10.2, 10.3] or $\sqrt{81 + 25}$ and [10.2, 10.3] or $9^2 + 5^2 = 106$ and $10^2 = 100$ and $11^2 = 121$	A1	oe
	Additional Guidance		
	Up to M2 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	Condone eg $12\,\text{cm}^2$ for 12^2		
	$9^2 + 5^2 = 106$ $x^2 = 106$ $x = 10.3$		M3A1
	Ignore further working after correct answer eg $\sqrt{9^2 + 5^2}$ and 10.3 with $10 > 10.3 < 11$		M3A1
	$9^2 + 5^2 = \sqrt{106} = 10.3$ omission of $\sqrt{9^2 + 5^2}$ or $9^2 + 5^2 = 106$ is a missing step		M3A0
	Using trigonometry or accurate/scale drawing only		M0

Q	Answer	Mark	Comments
24(a)	$y = 2x + c$ or $y - 2x = c$	B1	oe $c \neq 9$
	Additional Guidance		
	Answer $y = 2x + c$ or $y - 2x = c$ (any letter for c)		B0
	$y - 2x + 1 = 9$		B1
	$y - 2x + 1 = 10$		B0

Q	Answer	Mark	Comments
24(b)	$y = 5x - 8$	B1	