



GCSE MATHEMATICS 8300/2F

Foundation Tier Paper 2 Calculator
Final Third

Mark scheme
November 2024

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 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 $a \leq \text{value} < b$
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.

Q	Answer	Mark	Comments
18	X is directly proportional to $\frac{1}{Y}$	B1	

Q	Answer	Mark	Comments
19	Alternative method 1		
	$1.7^2 - 1.5^2 = 0.64$ and $\sqrt{0.64} = 0.8$ or $2.89 - 2.25 = 0.64$ and $\sqrt{0.64} = 0.8$	B2	accept $0.8^2 = 0.64$ for $\sqrt{0.64} = 0.8$ accept $\sqrt{1.7^2 - 1.5^2} = 0.8$ for B2 accept $1.7^2 - 1.5^2 = 0.8^2$ for B2 B1 1.7^2 and 1.5^2 oe
	Alternative method 2		
	$1.7^2 - 0.8^2 = 2.25$ and $\sqrt{2.25} = 1.5$ or $2.89 - 0.64 = 2.25$ and $\sqrt{2.25} = 1.5$	B2	accept $1.5^2 = 2.25$ for $\sqrt{2.25} = 1.5$ accept $\sqrt{1.7^2 - 0.8^2} = 1.5$ for B2 accept $1.7^2 - 0.8^2 = 1.5^2$ for B2 B1 1.7^2 and 0.8^2 oe
	Alternative method 3		
	$0.8^2 + 1.5^2 = 2.89$ and $\sqrt{2.89} = 1.7$ or $0.64 + 2.25 = 2.89$ and $\sqrt{2.89} = 1.7$	B2	accept $1.7^2 = 2.89$ for $\sqrt{2.89} = 1.7$ accept $\sqrt{0.8^2 + 1.5^2} = 1.7$ for B2 accept $0.8^2 + 1.5^2 = 1.7^2$ for B2 B1 0.8^2 and 1.5^2 oe
	Additional Guidance		
	B1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	$1.7^2 - 1.5^2 = 0.64$ $x^2 = 0.64$ $x = 0.8$		B2
	Max B1 if any incorrect statement seen eg $1.7^2 - 1.5^2 = \sqrt{0.64} = 0.8$		B1
	Accept 1.7×1.7 for 1.7^2 etc		
	Condone eg 1.5 cm^2 and 1.7 cm^2 for 1.5^2 and 1.7^2 for B1 but must be recovered for B2		
	$0.64 \div 0.8 = 0.8$ is equivalent to $\sqrt{0.64} = 0.8$		

Q	Answer	Mark	Comments
20(a)	125×0.32 or 40 or 80×0.35 or 28	M1	oe
	12	A1	
	Additional Guidance		
	M1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	$80 \times 0.5 = 40$		M0

Q	Answer	Mark	Comments
20(b)	No and valid reason involving the number of trials	B1	eg reasons she didn't do the most she did fewer spins Beth did more they should use all 205 spins
	Additional Guidance		
	Ignore irrelevant or incorrect statements alongside a correct statement as long as not contradictory		
	eg1 No and Beth did most but she could have done more		B1
	eg2 No and Beth has more number of spins so there is a higher probability of landing on heads		B1
	eg3 No and Beth did most spins but Lynn did more		B0
	Allow 'she' to refer to Lynn unless clearly referring to Beth eg No and Because she tried 125 times however Lynn tried only 80 times		B1
	No and She did not do as many spins so her answer is less accurate than Beth's		B1
	No and Beth spun the wheel more times. Therefore her probability would be lower		B1
	No and Beth spun more times so her final outcome will be higher		B1
	No and Beth did 125 spins and Lynn did 80 spins		B0
	No and Beth did 125 spins so she has more chance of being accurate		B0

Q	Answer	Mark	Comments
21	digits $537 \div$ digits 895 or answer with only digit 6	M1	eg $537 \div 895$ or $537 \div 895000$ or $537 \div 0.895$ or 0.006 or 6000
	0.6 or $\frac{3}{5}$	A1	oe value eg $\frac{537}{895}$
	Additional Guidance		
	Ignore simplification or conversion attempt after correct answer seen		
	Condone eg $537 \div 895000^3$ for M1 but must be recovered for A1		

Q	Answer	Mark	Comments
22	Alternative method 1 – using sin 40		
	sin chosen or used	M1	
	$21 \times \sin 40$	M1dep	accept $21 \times [0.64, 0.643]$
	[13.49, 13.5]	A1	
	Alternative method 2 – using cos 50		
	$\cos (90 - 40)$	M1	
	$21 \times \cos (90 - 40)$	M1dep	oe accept $21 \times [0.64, 0.643]$
	[13.49, 13.5]	A1	
	Alternative method 3 – finds base then uses Pythagoras		
	$21^2 - (21 \sin (90 - 40))^2$	M1	oe complete method except square root
	$\sqrt{21^2 - (21 \sin (90 - 40))^2}$ or $\sqrt{[182.2, 182.22]}$	M1dep	oe
	[13.49, 13.5]	A1	
	Additional Guidance		
	Check diagram for working		
	Allow correct use of sine rule to indicate sin		
	Ignore rounding or truncating after the correct answer is seen eg answer 14 after 13.5 seen		M1M1A1
	$\sin 40 \times 21$		M2
	sin may be indicated by eg circling S in SOH CAH TOA		
	Do not accept answers from full sized or scale drawing		
	sin 50 used (unless using Alt 3)		M0

Q	Answer	Mark	Comments
23	$8.5\text{m} \leq \text{length} < 9.5\text{m}$	B2	oe B1 8.5 or 9.5 in correct position SC1 $9.5\text{m} \leq \text{length} < 8.5\text{m}$
	Additional Guidance		
	Accept 9.49 for 9.5		
	Accept eg 8.50 for 8.5		

Q	Answer	Mark	Comments
24	$1 + 0.2$ or 1.2 or $100(\%) + 20(\%)$ or $120(\%)$	M1	oe eg $x + 0.2x$ implied by eg $20\% = 64\,000$ or $10\% = 32\,000$
	$384\,000 \div 1.2$ or $384\,000 \div 120 (\times 100)$ or $3200 (\times 100)$	M1dep	oe eg $64\,000 \times 5$ or $32\,000 \times 10$
	320 000	A1	
	Additional Guidance		
	M1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	460 800 is M0 unless 1.2 oe seen		
	Correct answer followed by further work		M2A0

Q	Answer	Mark	Comments
25	x^3y or yx^3	B1	
	$5xy^3$ or $5y^3x$	B1	
	$5x^2y^2$ or $5y^2x^2$	B1	
	Additional Guidance		
	Mark the answer lines unless blank		
	Do not allow transcription errors		

Q	Answer	Mark	Comments
26	$4x + 1 = 2x + 17$	M1	oe equation in terms of x any letter
	$4x - 2x = 17 - 1$ or $1 - 17 = 2x - 4x$ or $(x =) 8$	M1dep	oe collection of terms
	Correctly substitutes their 8 into a correct expression for the length or width of the rectangle	M1	their $8 > 0$ and their $8 \neq 1$
	Correct method for both the length and the width of the rectangle using their 8	M1dep	their $8 > 0$ and their $8 \neq 1$ dep on 3rd M
	3267	A1	SC1 $12x + 3$ or $6x + 51$
	Additional Guidance		
	The first M1 or SC1 may be awarded for correct work with no answer or incorrect answer, even if this is seen amongst multiple attempts		
	Trial and improvement to find $(x =) 8$ is M2		
	Using an incorrect value of x for 3rd and 4th marks eg when $x = 10$ $4 \times 10 + 1 = 41$ and $41 \times 3 = 123$ or $12 \times 10 + 3 = 123$ and $123 \div 3 = 41$ or $2 \times 10 + 17 = 37$ and $6 \times 10 + 51 = 111$		M0M0M1M1dep M0M0M1M1dep M0M0M1M1dep