



GCSE MARKING SCHEME

AUTUMN 2024

**GCSE
MATHEMATICS – COMPONENT 1
(HIGHER TIER)
C300UA0-1**

About this marking scheme

The purpose of this marking scheme is to provide teachers, learners, and other interested parties, with an understanding of the assessment criteria used to assess this specific assessment.

This marking scheme reflects the criteria by which this assessment was marked in a live series and was finalised following detailed discussion at an examiners' conference. A team of qualified examiners were trained specifically in the application of this marking scheme. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners. It may not be possible, or appropriate, to capture every variation that a candidate may present in their responses within this marking scheme. However, during the training conference, examiners were guided in using their professional judgement to credit alternative valid responses as instructed by the document, and through reviewing exemplar responses.

Without the benefit of participation in the examiners' conference, teachers, learners and other users, may have different views on certain matters of detail or interpretation. Therefore, it is strongly recommended that this marking scheme is used alongside other guidance, such as published exemplar materials or Guidance for Teaching. This marking scheme is final and will not be changed, unless in the event that a clear error is identified, as it reflects the criteria used to assess candidate responses during the live series.

EDUQAS GCSE MATHEMATICS

AUTUMN 2024 MARK SCHEME

Component 1: Higher Tier	Mark	Comment
1*.(a) $8a + 22$ OR $2(4a + 11)$	B2	B1 for one of the following: $8a + k$ where $k \neq 0$ $ka + 22$ where $k \neq 0$ $15a - 6 - 7a + 28$ Mark final answer for B2 only -1 for incorrect further work
1*.(b) $5x + 7 + 6x - 9 + 8x - 27 = 180$ $19x = 209$ $x = 11$ Method to calculate all three angles e.g. $5 \times 11 + 7$ (= 62) $6 \times 11 - 9$ (= 57) $8 \times 11 - 27$ (= 61) OR calculates two angles by substitution and the third by subtracting sum from 180 All three angles correctly calculated: 62°, 57°, 61° (so not isosceles)	M1 A1 A1 M1 A1	May be seen in stages Allow M1 for $(180 - 7 + 9 + 27) \div (5 + 6 + 8)$ Implies M1 Allow $209 \div 19$ FT from $ax = b$ OR 'their 209' $\div$ 'their 19' provided M1 awarded For FT, accept answer written as a correctly simplified, improper fraction (unless it gives a whole number), mixed number or decimal. If answer is only given as a decimal, it must be correct to 1 decimal place – rounded or truncated. If $x \neq 11$ FT 'their x' provided $x \geq 4$ and M1 previously awarded. M1 implied if three angles correctly found (without working shown) from FT of 'their x' CAO If no marks, award: SC2 for $x = 11$, obtained with no working shown or trials used AND angles of 62°, 57°, 61° (so not isosceles) OR SC1 for $x = 11$ obtained with no working shown or trials used.

<u>Alternative method – showing that if two angles are equal, angle sum is not 180(°)</u> One pair of angles equated e.g. $6x - 9 = 5x + 7$ Correct value of x obtained e.g. $x = 16$ AND correct angle sum calculated e.g. $275(^{\circ})$ Both other pairs of angles equated e.g. $8x - 27 = 5x + 7$ AND $8x - 27 = 6x - 9$ Both equations solved correctly $x = 11\frac{1}{3}$ AND $x = 9$ AND correct angle sums calculated e.g. $186\frac{1}{3}(^{\circ})$ and $142(^{\circ})$	M1 A1 M1 A2	A1 for one correct value of x and the correct angle sum provided M1 awarded. <table><tr><td rowspan="4">$6x - 9 = 5x + 7$ $x = 16$</td><td>$5 \times 16 + 7 = 87$</td></tr><tr><td>$6 \times 16 - 9 = 87$</td></tr><tr><td>$8 \times 16 - 27 = 101$</td></tr><tr><td>Total = $275(^{\circ})$</td></tr><tr><td rowspan="4">$8x - 27 = 5x + 7$ $3x = 34$ $x = 11\frac{1}{3}$</td><td>$5 \times 11\frac{1}{3} + 7 = 63\frac{2}{3}$</td></tr><tr><td>$6 \times 11\frac{1}{3} - 9 = 59$</td></tr><tr><td>$8 \times 11\frac{1}{3} - 27 = 63\frac{2}{3}$</td></tr><tr><td>Total = $186\frac{1}{3}(^{\circ})$</td></tr><tr><td rowspan="4">$8x - 27 = 6x - 9$ $2x = 18$ $x = 9$</td><td>$5 \times 9 + 7 = 52$</td></tr><tr><td>$6 \times 9 - 9 = 45$</td></tr><tr><td>$8 \times 9 - 27 = 45$</td></tr><tr><td>Total = $142(^{\circ})$</td></tr></table>	$6x - 9 = 5x + 7$ $x = 16$	$5 \times 16 + 7 = 87$	$6 \times 16 - 9 = 87$	$8 \times 16 - 27 = 101$	Total = $275(^{\circ})$	$8x - 27 = 5x + 7$ $3x = 34$ $x = 11\frac{1}{3}$	$5 \times 11\frac{1}{3} + 7 = 63\frac{2}{3}$	$6 \times 11\frac{1}{3} - 9 = 59$	$8 \times 11\frac{1}{3} - 27 = 63\frac{2}{3}$	Total = $186\frac{1}{3}(^{\circ})$	$8x - 27 = 6x - 9$ $2x = 18$ $x = 9$	$5 \times 9 + 7 = 52$	$6 \times 9 - 9 = 45$	$8 \times 9 - 27 = 45$	Total = $142(^{\circ})$
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	(7)																
2*. (a) ($m =$) 2.5 ($n = 6 \times 2.5 =$) 15	B2 B1	Answer space takes precedence. B1 for one of the following: • $(p + q) = \binom{2}{6}$ not simplified e.g. $\binom{1}{3}$ • $2m = 5$ Strict FT 6 x 'their m' derived or stated – not from incorrect working.															
2. (b) $\binom{-3}{6}$	B1	Accept $\binom{3}{-6}$															
	(4)																

3*(a) Midpoints 5 15 25 35 $\frac{5 \times 10 + 15 \times 12 + 25 \times 16 + 35 \times 20}{(50 + 180 + 400 + 420)} (= 1050)$ $\div 50$ 21	B1 M1 m1 A1	Only FT for 'their midpoints' provided at least 3 of them are at the bounds or within the groups If midpoints are not stated, award B1 M1 for $50 + 180 + 400 + 420$ OR 1050 B1 M0 for 50,180,400 and 420 B0 M1 for the sum of 4 values with 3 correct FT correct evaluation using their midpoints. On FT, allow truncated answers or rounded to nearest whole number or better
3*(b) 40 (%)	B2	FT 'their 50' from (a) for B1 and B2 Do not allow 'their 50' = 100 B1 for sight of $\frac{12 + \frac{16}{2}}{50} (\times 100)$ Allow B1 for 20 out of 'their 50' On FT the percentage must be given correct to the nearest integer or better for the award of B2
	(6)	
4.(a) Method to find prime factors with two correct prime factors seen before the second error 2, 3, 3, 7, 7 $2 \times 3^2 \times 7^2$	M1 A1 B1	Must be a method of 'repeated division' CAO for sight of 5 correct factors – may be indicated in 'tree' or 'ladder'. (Ignore 1s) FT 'their derived primes' provided at least one index form used with at least one square. Do not FT non-primes. Allow $(2)(3^2)(7^2)$ and $2.3^2.7^2$ Do not allow $2,3^2,7^2$. Inclusion of 1 as a factor gets B0.
4.(b)(i) a^2bc^2	B1	
4.(b)(ii) $a^3b^3c^3$	B1	

4.(c) p = 3 q = 2 r = -3	B2	All three correct B1 for any two correct
	(7)	
5.(a) $-\frac{32}{9a}$	B2	B1 for one of the following: $\frac{32}{9a}$ $-\frac{32}{ka}$ where $k \neq 0$ $-\frac{k}{9a}$ where $k \neq 0$
5.(b) 6n - 9	B2	B1 for 6n +/- k where $k \neq 0$
5.(c)(i) 89	B1	
5.(c)(ii) 5c + 8d	B2	Mark the final expression as the answer unless indicated otherwise. B1 for any one of the following: - An answer of $kc+8d$ or $5c + kd$ where $k \neq 0$ - An answer of $3c + 5d$ (the 6th term) - Sight of $5c + 8d$ (not given as the answer)
	(7)	
6*(a) 5:1	B2	B1 for one of the following: 1500:300 OR 15:3 oe 1:5 from clear, correct unit conversion If no marks award SC1 for 1:2 (from 150:300 or 15:30)
6*(b)(i) $\frac{7}{15}$	B1	
6*(b)(ii) 560 ÷ (5+3) × 7 OR 560 – 560 ÷ (5+3)	M2	May be seen in stages M1 for sight of 560 ÷ (5 + 3) or 70
490 (g)	A1	CAO
	(6)	

7*.(a) $\frac{9}{10}$ and $\frac{1}{10}$ oe, correctly placed on the tree diagram $\frac{9}{50} \div \frac{9}{10}$ or $\frac{9}{10} \times x = \frac{9}{50}$ $\frac{1}{5}$ oe $\frac{1}{5}, \frac{4}{5}$ and $\frac{1}{5}, \frac{4}{5}$ oe on tennis branches	B1 M1 A1 B1	Allow equivalent decimal probabilities Implies M1 FT provided M1 awarded AND 'their $\frac{1}{5}$ and $\frac{4}{5}$' add to 1												
7*.(b) $(\frac{9}{10} \times \frac{4}{5}) + (\frac{1}{10} \times \frac{1}{5})$ oe $\frac{37}{50}$ oe	M2 A1	FT 'their $\frac{1}{5}$ and $\frac{4}{5}$' provided they add to 1 M1 for sight of $\frac{9}{10} \times \frac{4}{5}$ or $\frac{1}{10} \times \frac{1}{5}$ oe												
(7)														
8.*(a) <table border="1"> <thead> <tr> <th>True</th><th>False</th><th>Need more information</th></tr> </thead> <tbody> <tr> <td></td><td></td><td>✓</td></tr> <tr> <td>✓</td><td></td><td></td></tr> <tr> <td></td><td>✓</td><td></td></tr> </tbody> </table>	True	False	Need more information			✓	✓				✓		B2	For all three correct B1 for any two correct
True	False	Need more information												
		✓												
✓														
	✓													
8*.(b) Yes indicated or clearly implied (with indication of one 120° angle) with two 30° angles.	B2	B1 for a clear indication of interior angle of 120°												
8*.(c) $(\frac{10}{7.5} = \frac{12}{9} = \frac{8}{6})$ same scale factor = $\frac{4}{3}$ oe OR $(\frac{7.5}{10} = \frac{9}{12} = \frac{6}{8})$ same scale factor = $\frac{3}{4}$ oe	B2	B1 just for $\frac{10}{7.5} = \frac{12}{9} = \frac{8}{6}$ OR $\frac{7.5}{10} = \frac{9}{12} = \frac{6}{8}$ Award no marks if the ratios of less than three pairs of sides compared.												
<u>Alternative method 1</u> 12:10:8 and 9:7.5:6 both simplify to 6:5:4 oe OR both equivalent to 108:90:72 oe	B2	B1 for stating 12:10:8 = 9:7.5:6 without simplifying to 6:5:4												

<u>Alternative method 2</u> B2 for any one of the following: $7.5 \times \frac{12}{9} = 10 \text{ AND } 6 \times \frac{12}{9} = 8$ $10 \div \frac{12}{9} = 7.5 \text{ AND } 8 \div \frac{12}{9} = 6$ $9 \times \frac{10}{7.5} = 12 \text{ AND } 6 \times \frac{10}{7.5} = 8$ $12 \div \frac{10}{7.5} = 9 \text{ AND } 8 \div \frac{10}{7.5} = 6$ $9 \times \frac{8}{6} = 12 \text{ AND } 7.5 \times \frac{8}{6} = 10$ $12 \div \frac{8}{6} = 9 \text{ AND } 10 \div \frac{8}{6} = 7.5$	B2	B1 for any one of the following: $7.5 \times \frac{12}{9} = 10 \text{ OR } 6 \times \frac{12}{9} = 8$ $10 \div \frac{12}{9} = 7.5 \text{ OR } 8 \div \frac{12}{9} = 6$ $9 \times \frac{10}{7.5} = 12 \text{ OR } 6 \times \frac{10}{7.5} = 8$ $12 \div \frac{10}{7.5} = 9 \text{ OR } 8 \div \frac{10}{7.5} = 6$ $9 \times \frac{8}{6} = 12 \text{ OR } 7.5 \times \frac{8}{6} = 10$ $12 \div \frac{8}{6} = 9 \text{ OR } 10 \div \frac{8}{6} = 7.5$
	(6)	
9. (Area of both circles =) $2 \times \pi \times 4^2$ (Curved surface area =) $2 \times \pi \times 4 \times h$ oe (h =) $\frac{104\pi - \pi \times 4^2 \times 2}{2 \times \pi \times 4} \left(= \frac{72\pi}{8\pi} \right)$ (h=) 9	M1 M1 M2 A1	May be seen or implied in later work or by sight of 32π May be seen or implied in later work or by sight of $8\pi h$ FT 'their 32π' (or 16π) AND 'their 8π' provided both are multiples of π for M2 or M1 M1 for $2 \times \pi \times 4^2 + 2 \times \pi \times 4 \times h = 104\pi$ OR M1 for $32\pi + 8\pi h = 104\pi$ CAO
	(5)	

10. (a)		
Upper quartile = 35	B1	Seen or implied
Left whisker at 12 and right at 40	B1	
LQ 22, median 29 and UQ 35	B1	Must be seen in a correct box plot, FT their UQ; if no UQ is stated and it is not at 35 allow this mark provided $29 < \text{UQ} < 40$
10.(b)(i)		
210 (students)	B2	B1 for $280 \div 4 \times 3$ or 0.75×280 or appropriate sight of 75%
10.(b)(ii)		
Explanation, using both range and IQR with correct values, e.g. All three ranges are 28 AND two IQ ranges are 13, and the other is 20	B3	May be seen by the diagrams. Allow B3 for all three ranges are 28 AND only two of the IQR's are 13 provided no incorrect value given for the 20. Award B2 for one of the following: - An answer that would be awarded B3 but the 20 is incorrect. - a correct explanation with errors or omissions in the values given e.g. All three ranges are 27 AND only two IQ ranges are the same. - a correct explanation with no values given e.g. All three ranges are the same AND only two IQ ranges are the same. Award B1 for either: - All three ranges are 28 - the IQ ranges are 13, 20 and 13
10. (c)		
Reference to graph indicating that it shouldn't decrease.	E1	
	(9)	
11.(a)		
$(45\,000) \times 1.02^8 \times 0.95^3$	B2	B1 for $\times 1.02^8$ OR $\times 0.95^3$
11.(b)		
B	B1	
	(3)	

12. (a) 9	B2	B1 for $(\sqrt[3]{27})^2$ or $\sqrt[3]{(27^2)}$
12. (b) $1:k^{3/2}$ or $1:(\sqrt{k})^3$ or $1:\sqrt{k^3}$	B1	Allow $k^{3/2}$ oe
12. (c) $5g - 3f = 2wg$ $5g - 2wg = 3f$ or $-3f = 2wg - 5g$ $g(5 - 2w) = 3f$ or $-3f = g(2w - 5)$ $g = \frac{3f}{5-2w}$ or $g = \frac{-3f}{2w-5}$	B1 B1 B1 B1	FT until 2 nd error, provided equivalent difficulty All marks may be implied by further working Eliminate the fraction Isolation of 'g' terms Factorisation to give single 'g' term
<u>Alternative method</u> $5 - \frac{3f}{g} = 2w$ $5 - 2w = \frac{3f}{g}$ or $-\frac{3f}{g} = 2w - 5$ $g(5 - 2w) = 3f$ or $-3f = g(2w - 5)$ $g = \frac{3f}{5-2w}$ or $g = \frac{-3f}{2w-5}$	B1 B1 B1 B1	FT until 2 nd error, provided equivalent difficulty All marks may be implied by further working Isolation of 'g' terms Factorisation to give single 'g' term
	(7)	

13.(a)		FT until 2 nd error
$5(2x + 1) + (4x - 5)(2x + 3) (= 98)$	B1	Forming equation
$10x + 5 + 8x^2 + 12x - 10x - 15 (= 98)$	B1	Expanding both sets of brackets
$8x^2 + 12x - 108 = 0$	B1	Collecting all terms on one side
$2x^2 + 3x - 27 = 0$	B1	CAO without wrong working seen
13.(b)		
$(2x + 9)(x - 3)$	B2	B1 for one of the following: • $(2x-9)(x+3)$ • two brackets that expand to give $2x^2 + 3x - k$ OR $2x^2 + mx - 27$ where m and k are both positive
$(x = -4.5), x = 3$	B1	STRICT FT provided at least B1 previously awarded. FT 'their derived positive x value(s)' provided $2 < x < 5$ If two positive values found, both substitutions will need to be performed for M2/M1
Perimeter: $2(5 + (2 \times 3 + 1)) - 3$ + $2((2 \times 3 + 3) + 2(4 \times 3 - 5)) - 3$ OR $(7+7+5+(5-3))+9+9+7+(7-3)$ OR $14x + 8$ oe	M2	FT 'their 3' for possible M2 A0 provided at least one mark previously awarded M1 for one arithmetic slip in substitution – if lengths seen. Slip may be repeated. If substituting for two positive values only allow 1 slip for M1 OR (if using expression for perimeter) M1 for $14x + k$ or $kx + 8$ provided $k > 0$
50 (m)	A1	CAO If no marks awarded, SC2 for an answer of 50 (m) from $x = 3$
<u>Alternative method - using the formula for first 3 marks only</u>		
$(x =) \frac{-3 \pm \sqrt{(3)^2 - (4 \times 2 \times -27)}}{2 \times 2}$	M1	Allow 1 slip in substitution, but must be correct formula
$= \frac{-3 \pm \sqrt{225}}{4}$	A1	
$(x = -4.5), x = 3$	A1	
	(10)	

14.(a)		
Tangent drawn at time 6 seconds	M1	
$\frac{\text{Difference in } y}{\text{Difference in } x}$ oe	m1	Allow the m1 if two positive values are used.
Correctly evaluated negative gradient from their tangent	A1	Accept answer written as a correctly simplified, improper fraction (unless it gives a whole number), mixed number or decimal. If answer is only given as a decimal, it must be correct to 1 decimal place – rounded or truncated. Ignore units.
14.(b)		
17.5 or $\frac{35}{2}$ oe	B2	ISW B1 for $(37 - 2) \div 2$ Ignore units.
14.(c)		
Line drawn from (7, 40) to (7.8, 0)	B2	B1 for either - a line from (7, 40) through (7.5, 15) - sight of 48 seconds (from $40 \div 5/6$)
	(7)	
15.(a)		
No indicated or clearly implied and a correct answer seen (0.204545454 – 0.003 =) 0.201545454... or 0.2015 $\dot{4}$ or D	B2	Allow 0.2015 $\dot{4}$ without indication that A is incorrect B1 for 0.20154 without indication that A is incorrect
15.(b)		
Complete method e.g. $x = 0.1234234 \dots 1000x = 123.4234$ or $10x = 1.234234 \dots 10000x = 1234.234$ AND an attempt to subtract	M1	Or 10x and 10000x
$\frac{1233}{9990}$ or $\frac{411}{3330}$ oe	A1	Allow A1 for e.g. $\frac{123.3}{999}$
$\frac{137}{1110}$	A1	FT from M1A0 provided at least 1 stage of further working required
<u>Alternative method for the first mark</u>		
(0.1 + 0.0234234... =) $1/10 + 234/9990$ oe	M1	

15.(c)		
$2^5 \times 10^{3 \times 5}$	M1	Allow M1 for $1.9^5 \times 10^{3 \times 5}$
3.2×10^{16}	A2	A1 for 32×10^{15} or correctly converting 'their 32×10^{15} ' to standard form, provided of equivalent difficulty
		If no marks, award SC1 for an answer of 3.2×10^9 from $32 \times 10^{3+5}$
	(8)	
16.		
$0.5 \times 14 \times 15 \times 0.6$	M1	
63 (cm ²)	A1	
$63 \div 7 \times 16$ (π)	m1	FT 'their 63'
144 (π)	A1	
12 (cm)	A1	FT provided M1m1 awarded.
	(5)	
17.(a)		
$\frac{35}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}}$	M1	
$7\sqrt{5}$	A1	
$6\sqrt{5}$	A1	FT 'their $k\sqrt{5}$ '
Alternative method:		
$\left(\frac{35}{\sqrt{5}} - \frac{5}{\sqrt{5}} =\right) \quad \frac{30}{\sqrt{5}}$	B1	
$\frac{30}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}}$	M1	FT 'their $\frac{30}{\sqrt{5}}$ '
$6\sqrt{5}$	A1	
17.(b)		
$20 - 5a\sqrt{3} + 8\sqrt{3} - 6a$	M2	M1 for 3 terms correct
$20 - 6a + 40 = 18$	m1	FT provided M1 awarded
$a = 7$	A1	FT
$-5a + 8 + b = 0$	m1	FT
$b = 27$	A1	FT
	(9)	

18.(a) $(g^{-1}(x) =) \frac{x-3}{2}$	B2	B1 for $x = \frac{y-3}{2}$ If no marks award SC1 for $g^{-1}(x) = \frac{x+3}{2}$ OR $\frac{3-x}{2}$
18.(b) $gh(x) = 2x^2 + 3$ $hg(x) = (2x+3)^2$ or better $2x^2 + 3 = 4x^2 + 12x + 9 - x^2 + 1$ or better $0 = x^2 + 12x + 7$	B1 B1 M2 A1	May be seen in subsequent work M1 for one of the following: $2x^2 + 3 = (2x + 3)^2 - x^2 + 1$ $4x^2 + 12x + 9$ $2x^2 + 3 = 4x^2 + 12x + 9 - x^2 + 1$ with one error in the expansion of $(2x + 3)^2$ Convincing collection of terms
	(7)	