GCSE MARKING SCHEME

AUTUMN 2023

GCSE
MATHEMATICS – COMPONENT 2
(FOUNDATION TIER)
C300U20-1

INTRODUCTION

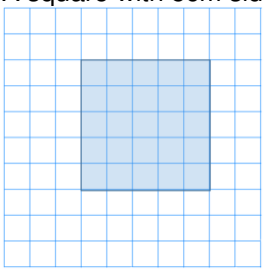
This marking scheme was used by WJEC for the 2023 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

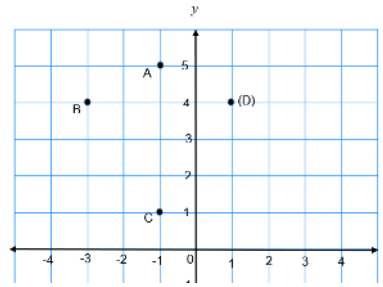
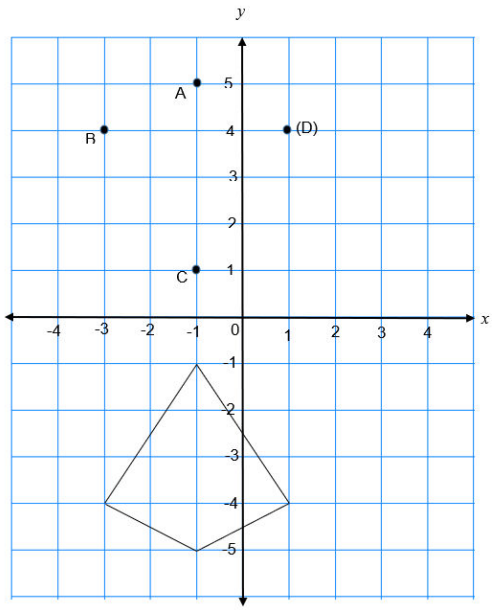
WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.

EDUQAS GCSE MATHEMATICS

AUTUMN 2023 MARK SCHEME

Component 2: Foundation Tier	Mark	Comment
1.(a) (£)0.68 + (£)4.45 or 68(p) + 445(p) = (£)5.13 or 513(p)	 M1 A1	 Allow for 68(p) + (£)4.45 If units are given, they must be correct. Allow £5.13p. If no marks, award SC1 for a correct evaluation of either small letter costs added to either parcel costs.
1.(b) 3 × 1.45 – 3 × 1.05 or 3 × 145 – 3 × 105 or 3 × (1.45 – 1.05) or 3 × (145 – 105) = (£)1.2(0) = 120(p)	 M1 A1	 May be seen in stages. If units are given, they must be correct. Allow £1.20p.
1.(c) 15.95 ÷ 1.45 oe = 11 (letters)	 M1 A1	 *e.g.11 repeated additions of 1.45* Allow an embedded answer.
1.(d) Yes, indicated or implied with a correct reason e.g. 'If they are all sent 2nd class.' 'It is only £3.40 to send them all 2nd class.'	 E1	 Allow '68 × 5 = 340(p)' '3.50 ÷ 0.68 = 5.1…' 'There will be 10p to spare.'
	(7)	
2.(a) A square with 5cm sides 	B1	
2.(b)(i) 24(cm)	B1	
2.(b)(ii) A rectangle with sides 11 × 1 or 10 × 2 or 9 × 3 or 8 × 4 or 7 × 5	 B1	 Allow a square with 6 cm sides. FT their perimeter provided it's even. *Note: Allow a square for FT answers.* *Note: Award the marks for a rectangle with a perimeter of 24cm even if it doesn't follow through (b)(i).*
	(3)	

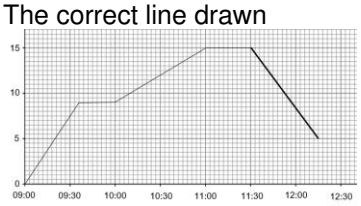
3.(a) 6 520 000	B1	
3.(b) 6 small triangles shaded	B1	
3.(c) $24 \div 6 + 4$ or $4 + 24 \div 6$	B1	
3.(d)(i) 465 780	B1	
3.(d)(ii) 466 000	B1	
	(5)	
4.(a)(i) Even chance	B1	
4.(a)(ii) Impossible	B1	
4.(b) 6/8 indicated on the probability scale  	B1	
4.(c) $\frac{13}{16}$ oe ISW	B1	
	(4)	
5.(a) 60	B1	
5.(b) $(360 - 90) \div 5$ $= 54$	M1 A1	$270 \div 5$
	(3)	

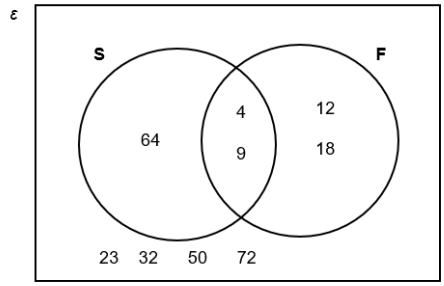
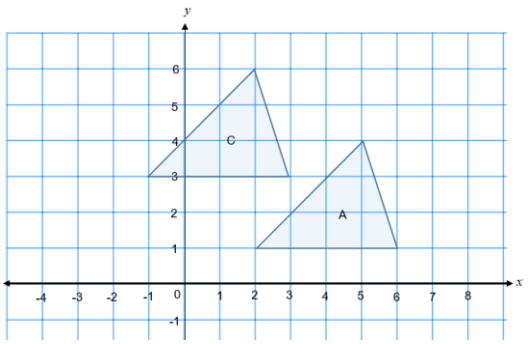
6.(a) D plotted at (1,4)  	B1	
6.(b) (1 , 4)	B1	FT 'their D'
6.(c) Correct reflection in the x axis.  	B2	FT their ABCD for B2 or B1. Allow B2 for the reflection of the 4 correct points not joined. B1 for a reflection with 3 correct points. B1 for a correct reflection in the y axis.
	(4)	
7.(a)(i) November	B1	
7.(a)(ii) 22 (°C)	B2	B1 for 34 – 12 or for a correct evaluation of 34 – a where 11 ≤ a ≤ 13 or b – 12 where 32 ≤ b ≤ 34
7.(a)(iii) June	B1	
7.(b) 1.8 × 25 + 32 = 77 (°F)	M1 A1	May be seen in stages. If no marks, award SC1 for sight of 45 (from 1.8 × 25)
	(6)	

8. (Cereal bar =) (£)1.25 (5.60 – 1.25) ÷ 3 (Drink =) (£)1.45	 B1 M1 A1	Allow the marks for the equivalent in pence. FT 'their 1.25' providing < £5. Allow rounded or truncated answers to the nearest penny. If units are given, they must be correct. Allow £1.45p. Note: Answer line takes precedence.
	(3)	
9.(a) 25 × 10.42 + 80 = (£)340.5(0) ISW	 M1 A1	 May be seen in stages. Unsupported (£)341 is awarded M1A0. If no marks, award SC1 for an answer of (£)367.50 (from use of £11.50 not £10.42)
9.(b) (271 – 64) ÷ 11.5(0) = 18 (hours)	 M1 A1	 May be seen in stages. Allow an embedded answer. If no marks, award SC1 for an answer of 265.43… (from 271 – 64 ÷ 11.5(0)) If no marks, award SC1 for an answer of 19.86, 19.9 or 20 (from use of £10.42 not £11.50)
	(4)	
10.(a) (3000 – 500 =) (£) 2500 0.37 × 2500 ÷ 5 oe = (£)185	 B1 M2 A1	 FT 'their 2500' including 3000 M1 for 0.37 × 2500 or (£)925 CAO
10.(b) $\frac{600}{3000}$ (× 100) oe = 20(%)	 M1 A1	
	(6)	
11.(a)(i) 6a – 2b	 B2	 Must be an expression for B2 B1 for sight of 6a or sight of -2b B1 for 6a + -2b Mark final answer.
11.(a)(ii) 3	 B1	
11.(b) 5n −10 or 5(n – 2)	 B2	 Allow for any equivalent expression. e.g. 5×(n – 2) or (n – 2)×5 or 5n – 2×5 Award B1 for one of the following: • (n − 2)5 • n5 – 10 • n – 2 × 5 • 5 × n – 2 • n = 5n - 10 B0 for sight of n – 10 or 5n – 2 alone.
	(5)	

12. $3 \times 352 + 43 \times 3 \times 7 + 85 \times 3$ OR $(352 + 43 \times 7 + 85) \times 3$	M2	May be seen in stages. $1056 + 903 + 255$ OR 738×3 M1 for any one of the following: • $3 \times 352 + 43 \times 3 + 85 \times 3$ $1056 + 129 + 255$ (= 1440) • $(352 + 43 + 85) \times 3$ 480×3 (= 1440) • $4 \times 352 + 43 \times 4 \times 7 + 85 \times 4$ $1408 + 1204 + 340$ (= 2952) • $3 \times 352 + 43 \times 3 \times 7 + 85 \times 3 \times 7$ (= 3744) $1056 + 903 + 1785$
= (£) 2214 ISW	A1	FT providing at least M1 awarded.
(Cheaper option) Pay separately	B1	FT their answer providing at least M1 previously awarded. If no marks, award SC1 for the three correct costs (Flights = 1056, Accommodation = 903, Food = 255) OR for 738 (the cost for one person)
	(4)	
13.(a)(i) Coin 1 / Coin 2 / Coin 3 **H** **H** **H** H H T H T H T H H H T T T H T T T H T T T	B2	For a fully correct table. Allow HHH to be repeated but no others. B1 for at least five different outcomes.
13.(a)(ii) $\frac{1}{8}$ oe	B1	FT $\frac{1}{\text{'their total number of outcomes'}}$, provided B1 previously awarded. *Note: 3/24 is awarded B0 (from counting H and T's in the table)*
13.(b) 0.375×136 oe = 51 (times)	M1 A1	 *Note: Answer of 51/136 is awarded M1 A0* If no marks, award SC1 for an answer of 85 (from 0.625×136)
	(5)	

14.(a) 39.97 – 0.32 × 56 (= 22.05) ÷ 245 = (£) 0.09 or 9 (p)	 M2 m1 A1	Allow the marks for the equivalent in pence. M1 for 0.32 × 56 (= 17.92) FT from M2 only CAO. Answer line takes precedence. If units are given, they must be correct. Allow £0.09p but not 0.09p.
14.(b) 210 × 0.32 + 30 × 0.28 oe = (£)75.6(0) (Overall monthly cost including VAT =) 1.05 × 75.6(0) or 75.6(0) + 0.05 × 75.6(0) oe = (£) 79.38	 M2 A1 M1 A1	Allow the marks for the equivalent in pence. May be seen in stages. M1 for 210 × 0.32 (= 67.2) or 30 × 0.28 (= 8.4) CAO FT 'their total cost excluding VAT' FT Allow rounded or truncated answers to the nearest penny.
<u>Alternative method</u> *210 × 0.32 × 1.05 + 30 × 0.28 × 1.05* *= (£) 79.38*	 *M3* *A2*	 *M2 for 210 × 0.32 × 1.05 (= 70.56)* *or 30 × 0.28 × 1.05 (= 8.82)* *M1 for 210 × 0.32 (= 67.2)* *or 30 × 0.28 (= 8.4)* *CAO* *If M2 or M1 awarded, then award A1 for a correct evaluation of 'their 70.56' + 'their 8.82' provided the calculations 210 × 0.32 AND 30 × 0.28 are embedded in their answer.*
	(9)	

15.(a) 24 (minutes)	B1	
15.(b) A correct explanation that refers to the steepness of the lines e.g. 'Before the puncture, the line was steeper.' 'After the puncture, the line was less steep.' 'The steeper the line the faster the speed.'	E1	Allow e.g. 'Line is steeper.' 'The gradient is bigger.' 'It's more of a vertical line.' 'The incline is greater.' Do not accept e.g. 'More miles in less time.' 'The line goes straight up.' 'It's more uphill.'
15.(c)(i) The correct line drawn  	B1	
15.(c)(ii) $10 \div 0.75$ = 13(.3…) or $13\frac{1}{3}$ or $\frac{40}{3}$ (mph)	M1 A1	Or equivalent e.g. $10 \div 3 \times 4$ Allow $10 \div 0.45$ or $10 \div 45$ for M1 CAO If no marks, award SC1 for an answer of 20 (from $15 \div 0.75$) OR 6.66.. or 6.7 (from $5 \div 0.75$)
	(5)	
16.(a) 330 (°)	B1	± 2 (°)
16.(b) The correct position marked	B3	± 2 (°) for each line. B2 for two intersecting lines where one is within tolerance OR for two lines within tolerance that don't intersect. B1 for one line within tolerance.
	(4)	

17.(a) A correct Venn diagram  	B2	B1 for 6, 7 or 8 unique numbers correctly placed. OR B1 for everything correct except sets S and F reversed OR B1 for all correct with 23, 32, 50 and 72 missing *<u>Note:</u> If numbers are used that are not from the set. Penalise -1 for each additional number.*
17.(b) $\frac{2}{9}$ oe	B2	ISW FT either the Venn diagram in (a) or the list BUT not both for B2 or B1 to candidates' advantage. *<u>Note:</u> Do not FT if they have no entries in the required section.* B1 for a numerator of 2 or a denominator of 9 in a fraction < 1. Allow B1 for '2 out of 9' or '2 in 9'
	(4)	
18.(a) All three elements correct: • rotation • 90° clockwise or 270° anticlockwise • about the origin or (0,0).	B2	B1 for one of the following: • Rotation 90° • Rotation 270° • Rotation about the origin or (0,0) • 90° clockwise about the origin or (0,0) • 270° anticlockwise about the origin or (0,0) *<u>Note:</u> Allow the origin to be written as 0,0 without brackets but not as 0.*
18.(b) Correct translation i.e. 3 squares to the left and 2 up  	B2	B1 for a correct horizontal or vertical translation *<u>Note:</u> mark a correct translation of triangle B as a mis-read.*
	(4)	
19.*(a) $\frac{2}{9}$ ISW	B1	
19.*(b) 1400 ÷ 4 × 3 = 1050	M1 A1	May be seen in stages.
	(3)	

20.* $12\,250 \times (1 - 0{\cdot}18) \times (1 - 0.15)^8$	M2	M1 for $12\,250 \times (1 - 0{\cdot}18)$ (= 10 045) OR $12\,250 \times (1 - 0{\cdot}15)^8$ (= 3338.0…) OR …..$\times (1 - 0{\cdot}18) \times (1 - 0{\cdot}15)^8$
An answer in the range (£)2737.15 to (£)2737.20	A1	Allow an answer of (£)2737 from correct working *(Year 8 value 3220.18 to 3220.20)*
(£)9512.80 to (£)9512.85 or (£)9513 *Allow answers not rounded or truncated*	B1	FT 'their car value' provided M2 awarded. Award M1 SC2 for an answer of (£)9923 or (£)9923.40 or (£)9923.41 OR M1 SC1 for an answer of (£)2326.59 from use of $12\,250 \times (1 - 0{\cdot}18) \times (1 - 0.15)^9$
	(4)	
21.*(a) Mid-points 62.5 67.5 72.5 77.5 82.5	B1	May be implied from correct totals, see below
$62.5 \times 19 + 67.5 \times 17 + 72.5 \times 23 +$ $77.5 \times 10 + 82.5 \times 1$	M1	FT 'their mid-points' provided at least 4 of these are at the bounds or within the groups 1187.5 + 1147.5 + 1667.5 + 775 + 82.5 (= 4860) If mid-points are **not** given, then no marks except for the following cases: • B1 M0 for five correct products not added • B1 M1 for five correct products in an addition • B0 M1 for four correct products in an addition
÷ 70	m1	
= 69.4(2…) (cm)	A1	FT Accept 69 (cm) from correct working.
21.*(b) No indicated or clearly implied and a suitable explanation e.g. 'The median is in the group $65 \leq l < 70$.' 'The median is the 35th (or 35.5th) term and in the group $65 \leq l < 70$.'	B1	Allow 'No' with an explanation e.g. '(In group) 65 – 70' Do not allow 'No' and explanation based on 69(.42) or 'their 69(.42)' e.g. 69 is not between 70 and 75 (use of mean) or '70 to 75 is the modal length'
	(5)	
22.*(a) 40 (circles)	B1	
22.*(b) $60\times96 - 40\times\pi\times6^2$	M3	May be seen in stages. FT their 40 provided between 6 and 50 inclusive. M2 for $40\times\pi\times6^2$ M1 for $60\times96 - k\pi$ or sight of $\pi\times6^2$ or 113(.09..)
Answer in the range 1235.5 to 1238.4(cm^2)	A1	CAO. *If no marks, allow M1 for sight of $\pi\times6^2$ or 113(.09..) seen in (a) or by the diagram.*
	(5)	

23.*(a) $x^2 + 10x + 21$	B2	Mark final answer. B1 for sight of $x^2 + 3x + 7x + 21$ or a final answer of either • $x^2 + kx + 21$, $k \neq 0$ or 10 • $x^2 + 10x + c$, $c \neq 0$ or 21
23.*(b) $3x = 1$ $(x =) \frac{1}{3}$ oe, ISW	B1 B1	 Accept 0.33 or $0.\dot{3}$ but not 0.3. FT from $ax = 1$, $a \neq 1$ or $3x = b$ accept $\frac{1}{a}$ or $\frac{b}{3}$ but if on FT either simplifies to an integer the answer must be given as an integer. 'x =' can be omitted but must not be wrong if there. Correct answer implies first B1.
23.*(c) $(y + 20)(y - 20)$	B1	Allow $(x + 20)(x - 20)$ oe
23.*(d) Method to eliminate an unknown e.g. equal coefficients AND appropriate addition or subtraction or rearranges one equation and substitutes into the other Finds one unknown Finds the other unknown	 M1 A1 A1	No marks for T&I; no marks for an unsupported answer. Allow one error in one term, not in the equated coefficients CAO; $x = 3.5$, $y = -0.5$ FT 'their x' or 'their y' used in one of their equations
	(8)	
24.* $(r =) 7.6 \times \frac{15.6}{10.4}$ or $7.6 \div \frac{10.4}{15.6}$ $= 11.4$ $(t =) 19.5 \div \frac{15.6}{10.4}$ or $19.5 \times \frac{10.4}{15.6}$ $= 13$	M1 A1 M1 A1	Or equivalent calculation that could lead to the correct answer. Or equivalent calculation that could lead to the correct answer. Note: If answers are reversed award M1 A0 M1 A0 SC1
	(4)	

25.*(a) Use of trigonometry in a right-angled triangle with an angle of 48(°) or 42(°) and a side of 800 (m) $(h =) \frac{800}{\cos(42)}$ or $(h =) \frac{800}{\sin(48)}$ (h =) 1076(.5….) or 1077 (feet)	S1 M2 A1	Trig ratio used may not be correct at this stage. Or equivalent full method. M1 for $\cos(42) = \frac{800}{h}$ or $\sin(48) = \frac{800}{h}$ Allow 1076 from correct working
25.*(b)(i) A correct assumption e.g. 'The (surface of) the slope is smooth (and he cycles the shortest distance).'	E1	Allow e.g. 'He rode in a straight line.' 'It was a straight line.' 'The track wasn't bumpy.' 'He cycled straight from the top to the bottom.' 'He didn't do any jumps.' 'There are no obstructions.' 'The surface is flat.' 'He cycled the shortest distance.' 'That it was 48° the whole way down'. 'That it is a right-angled triangle'. 'The track is level' (assume they mean not bumpy) Do not allow: 'That it was 48°'
25.*(b)(ii) A correct effect of assumption e.g. 'If the surface of the slope is not smooth then Vaughan will have cycled further than the calculated value in (a).'	E1	If no valid assumption is made, then this mark cannot be awarded. Cannot award E0 E1. Allow e.g. 'He cycled further.' 'The answer would be bigger.' Do not allow: 'The answer would be different'.
	(6)	