



GCSE MARKING SCHEME

SUMMER 2023

**GCSE
MATHEMATICS – NUMERACY
UNIT 2 – INTERMEDIATE TIER
3310U40-1**

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.

WJEC GCSE MATHEMATICS - NUMERACY

SUMMER 2023 MARK SCHEME

[illegible]

3(b) (Number of litres of fuel) $(33860 - 32474) \div 4$ $= 346.5$ (litres) (Cost of fuel) $346.5 \times 1(.)86$ $(£)644.49$ or $64449(p)$	M2 A1 M1 A1	M1 for (km travelled) $33860 - 32474 (= 1386)$ Allow rounded to 347 or truncated to 346, provided not from incorrect working, including from trial and improvement, May be implied in later work If M0 A0, award SC1 for any one of the following: • $(33860 \div 4 =)$ 8465 • $(32474 \div 4 =)$ 8118.5 • $((33860 + 32474) \div 4 = 66334 \div 4 =)$ 16583.5 FT 'their number of litres of fuel' CAO. If units are given, they must be correct
3(b) <u>Alternative method:</u> (Fuel cost per km) $1(.)86 \div 4$ $= 46.5$ (p/km) or 0.465 (£/km) (Distance travelled $33860 - 32474 =$) 1386 (km) (Cost of fuel) 1386×0.465 or 1386×46.5 $(£)644.49$ or $64449(p)$	M1 A1 B1 M1 A1	Allow rounded to $(0.)47$ or truncated to $(0.)46$ FT $1386 \times$ 'their derived 46.5' or $1386 \times$ 'their derived 0.465' OR FT 'their 1386' $\times$ 'their $1(.)86 \div 4$', including use of 33860, 32474 and $33860 + 32474$ CAO. If units are given, they must be correct
4(a) $(700 \times 100 \div 2.5) \div 12$ or $700 \div 0.3(0)$ or $70000 \div 30$ or equivalent 2333(.3.... feet) or 2333(feet 4 inches)	M2 A1	Must be using given conversions May be seen in stages M1 for any one of the following: • Sight of 1 foot (12 inches) as 30(cm) • Intention of $(70000 \div 2.5)$ *** • Sight of digits 233(33...) *** • Intention $(700 \div 2.5) \div 12$*** • Sight of 28000 (inches) *** Allow with incorrect place value, due to incorrect or no conversion, but division has been implied CAO. Ignore if an incorrect unit is given

4(b) 1.34 $\times 8 \div 5$ or $\times 1.6$ (to convert miles to km) $\times 1000$ (to convert km to m) $\div 84$ (to find number of minutes) (Time correct to the nearest minute) 2(:) 26 p.m. or 14(:)26	M1 M1 M1 A2	May be seen in any order Allow $\times 1.61$ or $\times 1.609$ Do not accept $\times 1.5$ (= 2144 m) Accept embedded '$\times 1000$', e.g. sight of 1340, ($1.34 \times 1200 =$) 1608, ($1.34 \times 1500 =$) 2010 (i.e. $\times 1500$ is awarded M0 M1) (= 25.52...minutes) (Note: sight of $\div 0.084$ is equivalent to $\times 1000$ (M1) and $\div 84$ (M1)) Ignore further incorrect stages of working, provided they do not involve multiplication or division by 1.6, 1000 or 84 CAO. Answer space takes precedence A2 awarded only if there is no incorrect working Depends on M1 M1 M1 previously awarded, for rounding time to nearest minute and adding to 2 p.m. Allow 2.26 p.m. or 14.26(p.m.) Award A1 for any one of the following: • 2(:) 25(.5...) p.m. or 14(:)25(5...) • 2(:)26 or 2(:)26 a.m. or 02(:)26 or 02(:)26 p.m. • 26 (minutes) • FT from M2 (or M3) for 'their correctly rounded time to the nearest minute' added to 2 p.m. expressed with p.m. or correct 24-hr notation, provided $1 < \text{'their whole number of minutes'} < 60$ • FT from M0 M1 M1 ○ for use of $\times 1500$m to give 2(:)24 p.m. or 14(:)24 ○ for $1.34 \times 1000 \div 84 = 15.952...$ to give 2(:)16 p.m. or 14(:)16 ** ** $84 \times 16 = 1344$ is awarded M0 M1 M1, with possible FT A1 for 2(:)16 p.m. or 14(:)16
4(b) <u>Alternative method:</u> 84 $\div 1.6$ $\div 1000$ $1.34 \div (84 \div 1.6 \div 1000)$ (time taken) (Time correct to the nearest minute) 2(:) 26 p.m. or 14(:)26	M1 M1 M1 A2	<i>Initial 2 method marks may be in either order</i> Or $\div 1.61$ or $\div 1.609$ $\div 1500$ is M0 M1 CAO. Answer space takes precedence A2 awarded only if there is no incorrect working Depends on M1 M1 M1 previously awarded, for rounding time to nearest minute and adding to 2 p.m. Allow 2.26 p.m. or 14.26(p.m.) A1 as shown above FT from M0 M1 M1 and M2 as shown above
5(a) (Girls) $4 + 18 + 10 + 5$ AND (Boys) $3 + 20 + 11 + 4$ 'Correct' indicated or implied AND number of girls 37 AND number of boys 38	M2 A1	For M2 allow an error in 1 of the 8 values M1 for either (Girls) $4 + 18 + 10 + 5$ (=37) or (Boys) $3 + 20 + 11 + 4$ (=38) CAO

5(b) (Girls) $\frac{4}{37} (\times 100)$ OR (Boys) $\frac{3}{38} (\times 100)$ 10.8(....%) or 11(%) AND 7.8(9...%) or 7.9 (%) or 8(%) Difference 2.9(%)	M1 A2 A1	<u>FT 'their first values' and 'their 'totals' from (a)</u> <u>If their number of girls = their number of boys then FT</u> <u>for possible first M1 A1 only</u> Do not accept '4 out of 37' or '3 out of 38' Do not award A2 or A1 from incorrect working seen Allow A2 as implied by a final answer in the range 2.8(%) to 3.2(%) from the sight of the appropriate decimals if individual percentages are not seen A1 for any one of the following: • (Girls) 10.8(....%) or 11(%) • (Boys) 7.8(9...%) or 7.9 (%) or 8(%) • (Girls) 0.108... and (Boys) 0.078... Only FT from A2 previously awarded Answer space takes precedence Must be given as a percentage to 1 decimal place Do not FT from premature approximation If no marks, from appropriate working award SC1 for working with any one of the following: • (first and last 10 seconds) 9/37 and 7/38 • (last 10 seconds) 5/37 and 4/38 or equivalents as decimals or percentages OR SC2 for the respective answers: • (24.3(2...) – 18.4(2...)) 5.9(%) • (13.5(1...) – 10.5(2...) = 2.99 =) 3.0 (%)
6a(i) (Median group) $166 \leq h < 174$ Reason, e.g. '14th height'	B1 E1	Accept '166 to 174' or '166 – 174' or 'third group' or 'group 3' or similar Do not accept 9 or 14 or 170 Depends on B1 previously awarded or previous B0 was due to giving the answer '9', '14' or '170' E1 for clear indication that median height is the 14th Allow, e.g. sight of 14, 'middle person', 'middle height', 'by counting the frequencies, ½ the people are taller', 'half the people are taller', '13.5(th) (musician)', 'total of 27 (people), the middle of that is in the group' Do not accept, e.g. 'middle group', 'in the middle', 'middle', 'middle number', 'groups are not specific', 'because the median (height) is 174'

6(a)(ii) Indicates unambiguously 'No' with a valid reason, such as 'only know the group' 'it doesn't show raw data' 'the actual heights are not given', 'the 3 people could be anywhere in the group 150cm to (less than) 158cm', 'no way of knowing individual heights'	E1	Ignore spurious additional comments Allow 'No' with, e.g. 'don't know the height of these 3 people', 'all 3 people could all be 155cm tall', 'everyone in group 150cm to 158cm could be 157cm', 'could all be taller than 154(cm)', '3 of them from 150 to 158 but not certain of height', 'we only know they are between 150 and 158', 'of the 3 people there may be, (but it is not certain)', '(data is) not specific', 'little chance as there are only 3 people in the group', 'the groups are not that specific', 'it's not specific enough', 'there is a possibility that there is one person shorter than 154cm as the midpoint is 154cm' Do not accept, e.g. 'everyone in the group 150cm to 158cm could be 158cm tall'
6(b) Midpoints 154, 162, 170, 178, (186,) 194 $154 \times 3 + 162 \times 10 + 170 \times 9 + 178 \times 4 + (186 \times 0) + 194 \times 1$ (= 462 + 1620 + 1530 + 712 + 0 + 194 = 4518) $\div 27$ 167(.333.... cm) or equivalent	B1 M1 m1 A1	186×0 may not be seen FT 'their midpoints' or at the bounds of the appropriate groups, provided no more than one of 'their midpoints' lies outside the group ISW Treat an error of e.g. 186×0 written as 186, leading to total 4704, $4704 \div 27 = 174(.222....)$ as follows: B1 M1 m1 possible but A0 or equivalents on FT
7. 1800×1.02^{28} 3133 (steps) or 3134 (steps)	M2 A2	M1 for any one of the following: - sight of 1800×1.02 $(1800 \times 1.02 =) 1836$ - from non-compound: $(1800 + 36 \times 28 =) 1800 + 1008$ $(28 \times 2\% = 56\% \text{ so } 1.56 \times 1800$ - a final answer of 2808 CAO A1 for 3133.8(... steps) If no marks, award SC1 for 1800×1.02^{27} or 1800×1.02^{29} or 3072.3(9...) or 3196.5(2...) OR SC2 for 3072 or 3073 (steps) or 3196 or 3197 (steps) respectively
8(a) A1	B1	

8(b) $59.4 \times 42(.0) \div (100 \times 100)$ or 0.594×0.42 $\times 120$ 29.9376(g) or 29.94(g) or an answer in the range 29.8 (g) to 30 (g)	M2 m1 A1	For a product using the correct place value in the conversion of units (= 0.249(48 m ²) or 0.25 (m ²)) Do not accept use of 59 instead of 59.4 for M2 M1 for a calculation including the product of digits 59(.4) and 42(.0), which may include error(s) due to place value FT from M2 or M1 CAO. Statement answer space takes precedence If incorrect size of paper selected, award SC2 for the following answers, allow suitable rounding, or truncation at 1 or more decimal place(s): <table><tr><td>A0*</td><td>A1</td><td>A3</td><td>A4</td></tr><tr><td>119.993..(g)*</td><td>59.946...(g)</td><td>14.9688(g)</td><td>7.4844(g)</td></tr></table> *Paper size A0 appropriate working or 119.9(...) must be seen OR Award SC1 for the appropriate digits with a place value error	A0*	A1	A3	A4	119.993..(g)*	59.946...(g)	14.9688(g)	7.4844(g)
A0*	A1	A3	A4							
119.993..(g)*	59.946...(g)	14.9688(g)	7.4844(g)							
8(c) (Diagonal A4 ² =) $21^2 + 29.7^2$ Diagonal ² = 1323.09 or (Diagonal =) $\sqrt{1323.09}$ (Diagonal A4 =) 36 (cm) or 36.3(7... cm) or 36.4 (cm) (Diagonal A5) $36.37... \times 21(.0) \div 29.7$ or $36.37... \times 0.7(0....)$ or $36.37... \div (29.7 \div 21(.0))$ or $36.37... \div 1.4(1...)$ Answer in the range 25.2 (cm) to 26(cm)	M1 A1 A1 M1 A1	May be shown in further working FT from M1 for the correctly evaluated square root of 'their 1323.09' provided 'their answer' > 29.7 (cm) Must be from correct working FT 'their derived diagonal' or 'their stated diagonal' provided $\neq 21$ or $\neq 29.7$ Answer must be from correct working.								
8(c) <i>Alternative method:</i> (Side of A5) $21(.0) \times 21(.0) \div 29.7$ or $21 \times 0.7(0...)$ or $21 \div 1.4(1...)$ or $29.7 \div 2$ Answer in the range 14.7 (cm) to 15(cm) (Diagonal A5 ² =) $21(.0)^2 + 14.848...^2$ Diagonal ² = 661.4775.... or (Diagonal =) $\sqrt{661.4775...}$ (Diagonal A5) Answer in the range 25.2 (cm) to 26(cm)	M1 A1 M1 A1 A1	May be shown in further working Must be from correct working FT 'their derived side of A5' or 'their stated side of A5' provided $\neq 21$ or $\neq 29.7$ Answer must be from correct working. FT from M1 for the correctly evaluated square root of 'their 661.4775...' provided 'their answer' > 21 (cm)								

8(d) Sight of 84.15(cm) or 841.5(mm) and 59.45 (cm) or 594.5(mm) or equivalents in m $2 \times (84.15 + 59.45)$ or $2 \times (84.1 + 59.4) + 4 \times 0.05$ or equivalent
