



GCSE MARKING SCHEME

SUMMER 2023

**GCSE
MATHEMATICS – NUMERACY
UNIT 1 – INTERMEDIATE TIER
3310U30-1**

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 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

Unit 1: Intermediate Tier	Mark	Comments
1. Method of comparison, e.g. per 10 ml or for 600 ml, or divide the cost of 30 ml by 3 and multiply by 4 or 5, or similar	M1	Needs to show attempt to compare at least 2 of the 3 sizes
Correctly evaluated comparison of 2 of the 3 sizes	A1	Ignore incorrect units With a 1 ml comparison, allow truncation to 4p for large and 3p for medium, provided no incorrect working is seen, for the award of the first A1. Award of final A1 also possible if a full comparison and conclusion is 'Medium'
Correctly evaluated comparison of all 3 sizes, may be different comparisons at different stages, AND conclusion 'Medium' or '40 ml' bottle is the best value for money	A1	Consistent units that are not obviously incorrect are required, or allow no units given Comparison of small / medium and medium / large IS a full comparison of all 3 sizes Comparison of small / medium and small / large IS a full comparison of all 3 sizes Comparison of medium / large and small / large IS NOT a full comparison of all 3 sizes
Organisation and communication	OC1	For OC1, candidates will be expected to: • present their response in a structured way • explain to the reader what they are doing at each step of their response • lay out their explanations and working in a way that is clear and logical • write a conclusion that draws together their results and explains what their answer means
Writing	W1	For W1, candidates will be expected to: • show all their working • make few, if any, errors in spelling, punctuation and grammar • use correct mathematical form in their working • use appropriate terminology, units, etc.
2(a) 4	B1	Accept 'x4', 'times 4' or ' $11 \times 4 = 44$ ' Do not accept a choice, e.g. '33% and 4 times'
2(b) 17/50	B1	CAO. Do not accept 34/100 or 17%/50%
2(c) 'Accomplishments'	B1	Allow 'Accomplishments 49%' Do not accept 49(%)

3(b)(i) 5 (couplings)	B1	
3(b)(ii) C = P - 1	B1	
4. (Electricity cost is) $400 \times (£)0.32$ or $400 \times 32(p)$ $(£)128$ or $12800(p)$ (All charges $£128 + 62 =$) $(£)190$ or $19000(p)$ (Total bill including VAT at 5%) $(£)199.5(0)$ or $19950(p)$	M1 A1 B1 B2	<u>Incorrect unit of money is penalised – 1 once only on the first occurrence, by withholding an A or B mark</u> Accept £128.00p FT 'their derived electricity cost' provided $\neq 400$ or $(0.)32$ May be seen or implied in further working Allow B1 for the correct evaluation of the sum of two resulting individual charges when VAT has been subtracted from either 'their derived electricity cost' or the standing charge, or from both, individually For B2, FT 'their all charges', accepting rounding or truncation to a penny, provided 'their all charges' is from attempted sum of electricity cost + standing charge For B1, FT for one of the following. (Electricity cost including VAT $1.05 \times 128 =$) $(£)128 + £6.40 =$ 13440(p) or $(£)134.4(0)$ $1.05 \times$ 'their cost of electricity' correctly evaluated (Standing charge cost including VAT =) $(£62 + £3.10 =)$ 6510(p) or $(£) 65.10$ Where 'their all charges' includes electricity and standing charge considered (includes, for example, if subtracted or added) (cost including VAT) $1.05 \times 190(.00)$ - sight of $1.05 \times$ 'their all charges' or equivalent (VAT) $(£)9.50$ or $950(p)$ $0.05 \times$ 'their all charges' correctly evaluated <u>including if embedded or implied in further working or totals</u>
5. Width 5 (cm) seen or implied Correct method to calculate the area of initial, e.g. $10 \times 5 - (10 - 2) \times (5 - 2)$ $10 \times 2 + (5 - 2) \times 2$ $5 \times 2 + (10 - 2) \times 2$ $8 \times 2 + 3 \times 2 + 2 \times 2$ $(26) \times (0.)50 \div 2$ or $(26) \times (0.)25$ or equivalent $(£)6.5(0)$ or $650(p)$	B1 M1 M1 A2	E.g. may be implied by the sight of the appropriate use of 5 in an area calculation FT 'their width' provided $2 < \text{'their width'} < 10$ Allow M1 if given as 2 or 3 separate areas provided sight of intention that it is the total area. Any subtraction of areas must be indicated FT 'their derived area' provided not 2, 10 or 5, but including partial or full perimeter CAO. For A2, if units are given they must be correct If M2 or M1 previously awarded, A1 for any one of the following: - Total area $26 \text{ (cm}^2\text{)}$ - Total cost for 'their derived area' - The sum or difference of 'their costs' would be a correct FT for 'their areas'. Any subtraction of costs needs to be indicated

6(a) A statement regarding e.g. Q1: 'not relevant', 'irrelevant' 'confidentiality', 'too personal', 'inappropriate question', 'it isn't about where you live', 'no reason for the question' Q2: 'times not exclusive', 'overlapping boxes' 'no period of time given', '5 times in 2 boxes', 'doesn't say if it is in a week', 'it is vague as it doesn't say in a month', 'how many times a month or a week?', 'should have put 6-10 times a week',	E1 E1	For any one equivalent statement. Ignore additional comments. Do not accept, e.g. 'no option boxes given', 'too open ended', 'no space to answer', 'not a clearly defined question', 'some people walk faster than others', 'doesn't have an answer for more than 5 minutes away', 'it doesn't make sense', 'many children do not know how far they live from school', 'they may not walk to school' For any one of these, or equivalent statement. Ignore additional comments. Do not accept, e.g. 'bias', 'not enough boxes to tick', 'not enough options', 'too vague' (unless a reason given), 'not specific' (unless a reason given), 'too broad' (unless a reason given), 'might not like board games', 'this isn't suitable because it has nothing to do with teachers', 'have other options' <u>SC1 if both correct but in reverse order.</u>
6(b) A criticism regarding - location (in the supermarket) - poor distribution method - does not target primary school children	E1	For any one of these, or equivalent statement. Ignore additional comments. Accept, e.g. 'may not be seen in the supermarket', 'wasn't asked verbally', 'should have been handed out', 'no guarantee anyone would answer them', 'won't know if a primary school child had filled it out', 'primary school children unlikely to be in a supermarket', 'children may not see it', 'supermarket targets adults', 'some may not go to supermarket as they shop online', 'supermarket is not the best place to fill a questionnaire', 'should be done in school', 'anyone could answer it not just primary school children' Do not accept, e.g. 'some children don't play board games', 'children play computer games', 'it would worry people who don't play board games'

7. (Mari's share of the prize) $4 \times 2700 \div (4 + 5)$ OR (Huw's share of the prize) $5 \times 2700 \div (4 + 5)$ (Mari's share is £) 1200 (Mari donates) 0.24×1200 (£) 288 (Fraction of his prize Huw donates) $\frac{0.24 \times 1200}{5 \times 2700 \div (4 + 5)}$ or $\frac{0.24 \times 1200}{2700 - 1200}$ or $\frac{288}{1500}$ or $1 - \frac{(1500 - 0.24 \times 1200)}{2700 - 1200}$ or $1 - \frac{1212}{1500}$ $\frac{24}{125}$	M1 A1 M1 A1 M1 A1	(4×300) (5×300) Allow for sight of (£)1200 irrespective of the name assigned May be implied in later calculation (Huw's share is £1500) FT $0.24 \times$ 'their smaller share' (Note: 'their smaller share' < 1350) FT 'their $0.24 \times$ 'their smaller share'' and $2700 -$ 'their smaller share' Must be a simplified fraction, ISW (e.g. 19.2%) An unsimplified fraction (144/750 or 96/500 or 72/375 or 48/250) is awarded M1 A0 Only FT if there are at least 2 different common prime factors for the numerator and denominator for simplifying, and not both numerator and denominator being a multiple of 10, i.e. equivalent level of difficulty If consistently working with Mari's getting the larger share, initially possible M1, A1 or M1, A0, but then M0, A0, M0, A0. However, also award SC2 for a final answer of $\frac{3}{10}$ or SC1 for (donation) (£)360. Mari with larger share leads to: $\frac{0.24 \times 1500}{2700 - 1500} = \frac{360}{1200} = \frac{3}{10}$
7. <u>Alternative method:</u> (Fraction of his prize Huw donates) $\frac{4 \times 24}{5 \times 100}$ $\frac{24}{125}$	M3 A3	M2 for sight of $\frac{1}{5}$ of 24% M1 for sight of $\frac{1}{5}$ of 24 Must be a simplified fraction A2 for correct unsimplified fraction, e.g. $\frac{96}{500}$ Only FT if there are at least 2 different common prime factors for the numerator and denominator for simplifying, i.e. equivalent level of difficulty ISW (e.g. 19.2%)

8(a) Width 3.9 cm AND Lengths 17.7 cm and 18.5 cm	B2	Accept lengths given in either order, 17.7 cm and 18.5 cm or 18.5 cm and 17.7 cm B1 for any 2 correct measurements
8(b) 9 : 35	B2	Mark final answer Must be expressed as a ratio for B1 or B2 B1 for sight of 4(.)5 : 17(.)5 or equivalent, or 35 : 9
8(c) (Strong) negative (correlation)	B1	CAO
8(d) Suitable line of best fit drawn	B1	The straight line (accept intention if a ruler is not used) must have points above and below it, generally this is 3 above and 4 below The line must be of sufficient length, to illustrate trend for at least 5 points The trend shows that there are points above and below the line at each end of the line Allow, e.g. the line of best fit following the 'trend' - from top left corner provided 3 points are above the line - with 2 points above the line, one point 'on' the line and 4 points below the line - with 3 points above the line, 2 'on' the line and 2 points below the line Do not accept, e.g. - a line from the bottom right corner - with 3 points above the line and 3 or 4 points 'on' the line - from top corner with 4 points 'on' the line - a line joining the first point to the last point - a 'corner to corner' line - line NOT drawn to follow the clear 'trend' - joining 'point to point' - a line of insufficient length, trend only shown for fewer than 5 points Note: 'on' the line includes a point just touching the line, no gap between the point and the line
8(e) 'No' indicated or implied with an explanation, e.g. 'not certain to fit the trend', 'only a small sample of remotes measured'	E1	Allow 'No' with, e.g. 'can be all different sizes of remotes', 'width does not depend on the length of the remote', 'width could be anywhere in the range 1 to 6 cm', 'not all remotes are the same width', 'insufficient data', 'may not fit the pattern' Do not accept 'No' with, e.g. 'no way of knowing' (without a reason), 'because you can't be certain' (without a reason)

9(a)(i) 11 (:00 am)	B1	Allow 11(:00 am) – 12(:)30 or 11(:00 am) to 12(:)30 Do not accept 11(:)00 pm or an incorrect time period for the first stop
9(a)(ii) 08:00 and 08:30	B1	
9(a)(iii) 15 km	B1	
9(b)(i) 300°	B1	
9(b)(ii) 1 : 100 000	B1	
9(c)(i) $1\,500\,000 \div (2 \times 60)$ 12500 (litres/min)	M2 A1	With no other further working May be shown in stages M1 for any one of the following, that may be embedded in further incorrect working: • $1\,500\,000 \div 2$ (or 750 000) • $1\,500\,000 \div 60$ (or 25 000) CAO
9(c)(ii) Sight of 30 000 (cm) AND $1\,500\,000\,000$ (cm ³) $1\,500\,000\,000 \div 30\,000$ or equivalent 50 000 (cm ²)	B1 M1 A1	Or two values of the correct comparative order, not for 1 500 000 and 300 For the intention of this division, allow with place value error (including $1\,500\,000 \div 300$) for M1 only CAO. ISW if sight of answer 50 000 cm²

10(a) (Sugar $0.58 \times 300 =$ 174 (g) (Cocoa $300 \div 8 =$ 37.5 (g) (Milk powder) $4 \times 37.5 \div 5$ (=) 30 (g) (Palm oil $300 - 174 - 37.5 - 30 =$ 58.5 (g) OR (Ingredients other than palm oil $174 + 37.5 + 30 =$ 241.5 (g) (% of Palm oil) $(100 \times) \frac{58.5}{300}$ or $58.5 \div 3$ or 0.195 or $(100 \times) 1 - \frac{241.5}{300}$ or $1 - 0.805$ or equivalent 19.5 (%)	B1 B1 M1 A1 B1 M1 A1	FT 'their derived mass of cocoa' May be implied in further working FT correctly evaluated sum of 'their sugar, cocoa and milk' provided at least 2 marks previously awarded and this sum is < 300 FT 'their 58.5' or 'their 241.5' as appropriate CAO, must be given as a percentage
10(a) <u>Alternative method 1:</u> (Cocoa) $\frac{1}{8} \times 100$ or $1 \div 8$ 12.5 % or 0.125 (Milk powder) $\square \times \frac{1}{8} (\times 100)$ 10 % or 0.1 (Other than palm oil) $(58 + 12.5 + 10 =) 80.5 \%$ or $(0.58 + 0.125 + 0.1 =) 0.805$ (Palm oil) $100 - (58 + 12.5 + 10)$ or $1 - (0.58 + 0.125 + 0.1)$ or 0.195 19.5 (%)	M1 A1 M1 A1 B1 M1 A1	FT 'their 12.5% or 0.125' or 'their % or decimal mass of cocoa' May be implied in further working FT 58 + 'their 12.5 + 10' or 0.58 + 'their 0.125 + 0.1' correctly evaluated provided at least 2 marks previously awarded and this sum is < 100 or < 1 respectively FT 58 + 'their sum of %s cocoa and milk' or equivalent working with decimals CAO, must be given as a percentage
10(a) <u>Alternative method 2:</u> (Proportion other than palm oil) $\frac{58}{100} + \frac{1}{8} + \frac{4}{5} \times \frac{1}{8}$ or $\frac{58}{100} + \frac{1}{8} + \frac{1}{10}$ $\frac{805}{1000}$ or $\frac{161}{200}$ (Palm oil) $1 - \frac{161}{200}$ or $\frac{39}{200}$ or $\frac{19.5}{100}$ 19.5 (%)	M3 A1 M2 A1	May be implied in further working FT from M3 CAO, must be given as a percentage
10(b) Realising that 840g is 120% For appropriate use of 120% being 840g, e.g. $840 \div 1.2$ or $8400 \div 12$ or $100 \times 840/120$ 700 (g)	B1 M1 A1	Also implies previous B1 Award all 3 marks for an answer of 700(g) provided not from incorrect working

11(a) 40 (seconds)	B1													
11(b) 0.9 × 60 or 60 - 0.1 × 60 = 54 (employees) In 60 seconds, 57 employees logged on or 54 employees logged on within 58 seconds	M1 A1 B1	<u>Penalise incorrect units -1 only.</u> Ignore additional spurious statements Check the diagram for indication, provided values are written FT 'their 54 employees' provided M1 previously awarded and number of seconds < 60												
11(b) <u>Alternative method 1:</u> By 1 minute, 57 employees logged on (100 ×) 57/60 0.95 or 95(%) or 570/600 compared with (90% =) 540/600	B1 M1 A1	<u>Penalise incorrect units -1 only.</u> If M0 A0, award SC1 for 'only 5% (or 0.05) not logged on' If no marks, award SC1 for an answer of 93(.3..) % or 96(.6..) % or rounded to 97% or equivalents as decimals from use of 56 or 58 respectively												
11(b) <u>Alternative method 2:</u> For clearly considering employees not logged on, must be evidence of this before awarding marks (0.1 × 60 =) 6 (employees not logged on) (After 9:01 a.m.) 60 – 57 3 (employees not logged on)	B1 M1 A1	<u>Penalise incorrect units -1 only.</u> If M0 A0, award SC1 for an answer of 4 or 2 employees from sight of calculation 60 - 56 or 60 - 58												
11(b) <u>Alternative method 3:</u> For clearly considering employees not logged on, must be evidence of this before awarding marks (0.1 × 60 =) 6 (employees not logged on) (For 6 employees not logged on graph gives) 58 seconds Conclusion that after 58 seconds there are fewer than 6 employees not logged (i.e. more than 90% logged on)	B1 M1 A1	<u>Penalise incorrect units -1 only.</u> FT 'their 6 employees' provided 0.1 × 60 attempted and 'their 58 seconds' < 60												
12(a) At a randomly chosen name	B1													
12(b) (360 ÷ 6 =) 60 or 360 ÷ 60 = 6 or 6 × 60 = 360 <table border="1"><tr><td>1st</td><td>2nd</td><td>3rd</td><td>4th</td><td>5th</td><td>6th</td></tr><tr><td>4</td><td>64</td><td>124</td><td>184</td><td>244</td><td>304</td></tr></table>	1st	2nd	3rd	4th	5th	6th	4	64	124	184	244	304	B1 B1	May be implied by any of the following: - consistent position patterns + 60 indicated for at least 3 consecutive positions e.g. (4,) 60, 120, 180, 240, 300 - sight of 64 for student 2 CAO
1st	2nd	3rd	4th	5th	6th									
4	64	124	184	244	304									

13(a) Correct format of a box-and-whisker Showing lower end whisker at 10 seconds Showing LQ 40 seconds Showing median at 84 seconds AND UQ at 108 seconds AND greatest time 130 seconds	B1 B1 B1 B1	Do not ignore additional lines drawn End stopper lines omitted can be ignored For unambiguous indications of the following: On the graph paper. Allow for the least point indicated On the graph paper. Must be the lower line of a rectangle On the graph paper Median and UQ must be unambiguous vertical lines, allow 130 indicated as a point or a vertical line
13(b) 6 seconds	B1	
13(c) 0.75×200 or equivalent 150 (phone calls)	M1 A1	Allow sight of '75% of 200' or '$\frac{3}{4}$ of 200' Answer space takes precedence If no marks, award SC1 for an answer of 50 (phone calls)