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 '×4', 'times 4' or '11 × 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(%)

<table>
<tr><td>2(d) Appropriate explanation, e.g.
‘(would have) needed to know the number of boys and girls in family category and total number of boys and the total of girls’,
‘(would have) needed to know the gender (or sex) of each of the teenagers’</td><td>E1</td><td>Ignore additional incorrect or spurious statements
Allow, e.g.
‘split (the original data) into boys and girls’,
‘do another survey asking boys and girls separately’,
‘sex’,
‘gender’
‘boys and girls on separate graphs’,
‘boys and girls’
‘how many boys and girls took part in the survey’,
‘need number of girls and boys who took part in the survey’,
‘need number of boys and girls for family’,
‘need percentage of girls and percentage of boys’

Do not accept, e.g.
‘repeat the survey’,
‘more detailed data’</td></tr>
<tr><td>2(e) 743 × 11/100 or 74.3 + 7.43 or equivalent
81 or 82 (teenagers)</td><td>M1
A2</td><td>Only award A2 provided not from incorrect working

Award A1 for any of the following:
• final answer 81.7(3)
• working leading to 81.(….) truncated or rounded to give a final answer of 81 or 82
• ‘their 81.7(3)’ rounded or truncated to a whole number

If no marks, award SC3 for a whole number answer in the range 79 to 85 (teenagers) from any of trials
100 × 79 ÷ 743 (= 10.6…), 100 × 80 ÷ 743 (=10.76…), …, 100 × 85 ÷ 743 (= 11.4…)</td></tr>
<tr><td>2(f) Suitable reason, e.g.
‘teenagers can select more than one type of information’,
‘some teenagers are represented by more than one row’</td><td>E1</td><td>Do not accept, e.g.
‘they have been rounded’,
‘because the data is grouped’</td></tr>
<tr><td>3(a)(i) 50 (baths)</td><td>B1</td><td>Do not accept 50/80</td></tr>
<tr><td>3(a)(ii) All appropriate products given, i.e.
• (Bath, Taps)
(10 + 40) × 180 AND (40 + 30) × 60
(=9000 AND 4200)

• (Bath, Bath & tap, Tap)
10 × 180 AND 40 × (180 + 60) AND 30 × 60
(=1800 AND 9600 AND 1800)

• (Bath, Split bath & tap, Tap)
10 × 180 AND 40×180 AND 40×60 AND 30×60
(= 1800 AND 7200 AND 2400 AND 1800)

(£) 13200</td><td>M2

A1</td><td><u>FT from either an error in evaluating ‘10 + 40’ or for 40 < ‘their 50’ < 60 in (a)(i)</u>
Allow intention if brackets are missing (for M2 or M1)
Intention to ‘add’ is not required
If additional working is seen, there needs to be clear indication of which are the appropriate products

M1 for any one of the following partial method, ignore any additional inappropriate products:
<table><tr><td>Baths</td><td>(10 + 40) × 180</td><td>£9000</td></tr><tr><td>Taps</td><td>(40 + 30) × 60</td><td>£4200</td></tr><tr><td>Bath only and tap only</td><td>10 × 180 and 30 × 60</td><td>£1800 and £1800</td></tr><tr><td>Bath with tap</td><td>40 × (180 + 60)</td><td>£9600</td></tr><tr><td>Bath with tap</td><td>40 × 180 and 40 × 60</td><td>£7200 and £2400</td></tr></table>
CAO, not from FT from (a)(i)</td></tr>
</table>

3(b)(i) 5 (couplings)	B1	
3(b)(ii) C = P - 1	B1	
4. (Electricity cost is) 400 ×(£)0.32 or 400 × 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 ≠ 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 × 128 =) (£128 + £6.40 =) 13440(p) or (£)134.4(0) • 1.05 × '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 × 190(.00) • sight of 1.05 × 'their all charges' or equivalent • (VAT) (£)9.50 or 950(p) • 0.05 × '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 × 5 – (10 – 2) × (5 – 2) • 10 × 2 + (5 – 2) × 2 • 5 × 2 + (10 – 2) × 2 • 8 × 2 + 3 × 2 + 2 × 2 (26) × (0.)50 ÷ 2 or (26) × (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 < '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 (cm^2) • 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'	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'
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	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' *SC1 if both correct but in reverse order.*
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) $5 \times 2700 \div (4 + 5)$	M1	(4×300) (5×300)
(Mari's share is £) 1200	A1	Allow for sight of (£)1200 irrespective of the name assigned May be implied in later calculation (Huw's share is £1500)
(Mari donates) 0.24×1200	M1	FT $0.24 \times$ 'their smaller share' (Note: 'their smaller share' < 1350)
(£) 288	A1	
(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 $1 - \frac{1212}{1500}$	M1	FT 'their $0.24 \times$ 'their smaller share'' and 2700 – 'their smaller share'
$\frac{24}{125}$	A1	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 $^{3}/_{10}$ 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. Alternative method: *(Fraction of his prize Huw donates)* $\frac{4}{5} \times \frac{24}{100}$	*M3*	*M2 for sight of ⅘ of 24%* *M1 for sight of ⅘ of 24*
$\frac{24}{125}$	*A3*	*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 ÷ (2 × 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 ÷ 2 (or 750 000) • 1 500 000 ÷ 60 (or 25 000) CAO
9(c)(ii) Sight of 30 000 (cm) AND 1 500 000 000 (cm^3) 1 500 000 000 ÷ 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 ÷ 300) for M1 only CAO. ISW if sight of answer 50 000 **cm^2**

10(a) (Sugar 0.58 × 300 =) 174 (g) (Cocoa 300 ÷ 8 =) 37.5 (g)	B1 B1	
(Milk powder) 4 × 37.5 ÷ 5 (=) 30 (g)	M1 A1	FT 'their derived mass of cocoa'
(Palm oil 300 – 174 – 37.5 – 30 =) 58.5 (g) OR (Ingredients other than palm oil 174 + 37.5 + 30 =) 241.5 (g)	B1	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
(% of Palm oil) (100 ×) $\frac{58.5}{300}$ or 58.5 ÷ 3 or 0.195 or (100 ×) 1 – $\frac{241.5}{300}$ or 1 – 0.805 or equivalent	M1	FT 'their 58.5' or 'their 241.5' as appropriate
19.5 (%)	A1	CAO, must be given as a percentage
10(a) Alternative method 1: *(Cocoa) ⅛ × 100 or 1 ÷ 8* *12.5 % or 0.125*	*M1* *A1*	
(Milk powder) □ × ⅛ (× 100) *10 % or 0.1*	*M1* *A1*	*FT 'their 12.5% or 0.125' or 'their % or decimal mass of cocoa'*
(Other than palm oil) (58 + 12.5 + 10 =) 80.5 % *or (0.58 + 0.125 + 0.1 =) 0.805*	*B1*	*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*
(Palm oil) 100 – (58 + 12.5 + 10) *or 1 – (0.58 + 0.125 + 0.1) or 0.195*	*M1*	*FT 58 + 'their sum of %s cocoa and milk' or equivalent working with decimals*
19.5 (%)	*A1*	*CAO, must be given as a percentage*
10(a) Alternative method 2: *(Proportion other than palm oil)* $\frac{58}{100}+\frac{1}{8}+\frac{4}{5}\times\frac{1}{8}$ *or* $\frac{58}{100}+\frac{1}{8}+\frac{1}{10}$	*M3*	
805/1000 or 161/200	*A1*	*May be implied in further working*
(Palm oil) $1-\frac{161}{200}$ *or* $\frac{39}{200}$ *or* $\frac{19.5}{100}$	*M2*	*FT from M3*
19.5 (%)	*A1*	*CAO, must be given as a percentage*
10(b) Realising that 840g is 120%	B1	
For appropriate use of 120% being 840g, e.g. 840 ÷ 1.2 or 8400 ÷ 12 or 100 × 840/120	M1	Also implies previous B1
700 (g)	A1	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	Penalise incorrect units -1 only. 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) Alternative method 1: *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*	*Penalise incorrect units -1 only.* *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) Alternative method 2: *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*	*Penalise incorrect units -1 only.* *If M0 A0, award SC1 for an answer of 4 or 2 employees from sight of calculation 60 - 56 or 60 - 58*
11(b) Alternative method 3: *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*	*Penalise incorrect units -1 only.* *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 1st 4 / 2nd 64 / 3rd 124 / 4th 184 / 5th 244 / 6th 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

13(a) Correct format of a box-and-whisker	B1	Do not ignore additional lines drawn End stopper lines omitted can be ignored For unambiguous indications of the following:
Showing lower end whisker at 10 seconds	B1	On the graph paper. Allow for the least point indicated
Showing LQ 40 seconds	B1	On the graph paper. Must be the lower line of a rectangle
Showing median at 84 seconds AND UQ at 108 seconds AND greatest time 130 seconds	B1	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 ' ¾ of 200' Answer space takes precedence If no marks, award SC1 for an answer of 50 (phone calls)