GCSE MARKING SCHEME

AUTUMN 2021

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

INTRODUCTION

This marking scheme was used by WJEC for the 2021 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

AUTUMN 2021 MARK SCHEME

Unit 1: Intermediate Tier	Mark	Comments
1(a) 16 km	B1	
1(b) 5:30 p.m.	B1	
1(c) very likely	B1	Mark selection (rather than answer space), but check answer space if no selection made
2(a) 54 (mm) or 55 (mm)	B2	B1 for sight of 154 (mm) or 155 (mm)
2(b) Indicates or unambiguously implies '**The same on both days'** with a reason, e.g. 'both the same at 9 a.m.', 'both at the same time', 'both full at 9 a.m.', 'both took 1 hour' 'both at 360mm at the same time', 'they start and finish at the same time', 'both meet the depth of water at the same time'	E1	Allow reference to 'both tanks' rather than 'both days' If a correct statement is made, ignore additional incorrect or spurious statements Allow 'same on both days' with a reason, e.g. 'both tanks have 360(mm)', 'the two lines meet at the same point', 'both tanks are filled (full) at the same time', 'the 2 lines finish at the same time', 'both get there at the same time' 'both peak (get to the top of the graph) at the same time' Do not accept, e.g. 'the 2 lines show the same information', 'the 2 lines are the same', 'he put water in the tank for both days' 'both tanks are filling at the same time'
2(c) 8(:)36 a.m. or 08(:)36	B1	Allow (0)8(:)36 (a.m.) Do not accept (0)8(:)36 p.m. Allow time reference to 'just before 08(:)36' or equivalent, but NOT 08(:)35

2(d) Indicates or unambiguously implies **Saturday** with a reason, e.g. 'steeper (rise)', 'gradient is more', 'over 100mm on Saturday but only about 15 mm on Friday'	E1	Allow additional spurious statements or incorrect values if clearly stating 'steeper' or similar Allow Saturday with, e.g. 'steep gradient', 'steep rise', '(approximately) 120 (mm) on Saturday', '(only) 14 (mm) on Friday', 'Saturday with steep drop', 'Saturday's water had increased more than Friday' 'the depth of water is greater in the 10 minutes', 'the line moves up faster on Saturday', 'it increases from 130 to 250(mm) on Saturday', 'it increases from 130 to 255(mm) on Saturday', 'it's a straight line going up so it is quicker', 'filled up quicker, line goes straight up unlike Friday' Allow values for: • Saturday a value in the range 120 to 125 (mm) or 'over 100 (mm)', 'greater than 110 (mm)', or similar • Friday a value in the range 13 to 17 (mm) or (give approximately as) 20 (mm) or 'greater than 10 (mm)' or similar Do not accept, Saturday with, e.g. 'Saturday has 250mm and Friday has 215mm', 'more water has been used on Saturday', 'the curve is more on Saturday', 'because it had more water in it', 'Saturday is faster than Friday', 'Saturday's time has increased more than on Friday'
2(e) 8:35 a.m.	B1	

3(a) (Total cost of 6 guitar lessons is) 5 × 23 – 5 × 0.15 × 23 + 23 (= 115 – 17.25 + 23) or 6 × 23 – 5 × 0.15 × 23 (= 138 – 17.25) or 5 × 0.85 × 23 + 23 (= 97.75 + 23) (Cost of 6 guitar lessons is) (£)120.75	M3 A1	Accept methods that show equivalents, e.g. 10% + ½ of 10% (= 11.5(0) + 5.75 = 17.25). M2 for any one of the following costs of 5 guitar lessons • 5× 23 – 5×0.15×23 (= £97.75) • 5×0.85×23 (= £97.75) Allow M2 for 6 × 0.85 × 23 (= £117.30) M1 for any one of the following • 0.15 × 23 (= £3.45) • 5 × 0.15 × 23 (= £17.25) Allow M1 for 6 × 0.15 × 23 (= £20.70) CAO If no marks, award SC1 for understanding the **full** process required (5 × 23 – 15% of 5 × 23 + 23), but are unable to apply a correct method to calculate either 15% or 85% of 23 or a multiple of 23, provided there is an attempt at deriving an amount for 15% or 85%. (Note: 5 × 23 – 15 + 23 is SC0)
Organisation and communication Writing	OC1 W1	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 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.
3(b) $\frac{18}{300}$ (× 100) 6(%)	M1 A1	Accept, e.g. • 1% is 3 with 18÷3 • 1% is 3 with sight of 6 lots of repeated addition • 6/100 • sight of 5% is 15 and 1% is 3 with implied 3 + 15 = 18 Allow M1 for 18/300 irrespective of further incorrect working, i.e. sight of attempt to evaluate 300 ÷ 18. Do not allow choice of 18/300 or 300/18 A0 if an incorrect unit is given
4(a)(i) 068(°) ± 2 (°)	B1	
4(a)(ii) 117(°) ± 2 (°)	B1	

4(b) Distance in the range 8 (miles) to 12 (miles)	B1	
Average speed = $\frac{8 \text{ to } 12}{0.5}$ or $\frac{8 \text{ to } 12}{½}$ or 2 ×(8 to 12)	M2	For M2 or M1, FT 'their distance' provided it is in the range 7 to 13 miles M1 for $\frac{8 \text{ to } 12}{30}$
Average speed in the range 16 (mph) to 24 (mph)	A1	Correct for 'their distance' Do not accept an unsupported answer in this range FT from M2 only If no marks, award SC1 for any of the following: • 'their distance' ÷ 0.5 correctly evaluated, including • 2 miles read from the question, divided by 0.5 to give an answer of 4 (mph) (Note: SC0 if 2 ÷ 30 or unsupported 4 (mph))
5.		If an evaluation is given with incorrect units, award B0 or A0 on the first occasion then FT
(FruitCo cost of 24 bananas) (£)2 or 200(p)	B1	CAO
(Mass of 24 bananas) 2400 (g) or 2.4 (kg) OR Appropriate use of 1 kg = 1000 g	B1	May be implied in further working Appropriate use of 1 kg = 1000 g can be checked by correct place value for Bach Market (e.g. 8.5p per banana) FT 'their 2400g' or 'their 2.4kg' for M and A marks provided mass of bananas not used as number of bananas, i.e. by the inappropriate use of 24
(Quick Fruit cost of 24 bananas) 4 × 2400 ÷ 50 OR 4 × 24 × 100 ÷ 50 OR 8(p) × 24 OR equivalent 192(p) or (£)1.92	M1 A1	 Accept full partition methods Award of this mark does not automatically imply the award of the second B mark
(Bach Market cost of 24 bananas) 85×2.4 OR 85 × 24 × 100 ÷ 1000 OR 24×8.5 OR equivalent 204(p) or (£)2.04	M1 A1	Do not FT for 85 × 24 alone, this is M0 Accept full partition methods Award of this mark implies the second B1 mark also
Conclusion 'Quick Fruit'	B1	FT provided at least 2 marks previously awarded and all 3 costs have been considered
6(a) 7500 × 1.6 or 7500 × 8 ÷ 5 or equivalent 12000 (km)	M1 A1	
6(b) 80 × 30 ÷ 100 **or** 25 × 30 ÷ 100 24 (m) (long) **and** 7.5 (m) (tall)	M1 m1 A2	Or sight of 2400 **or** 750 Do not penalise any answers reversed in the answer space A1 for any of the following: • an answer of 24 (m) • an answer of 7.5(m) • FT from M1 m1 or M1 m0: 80 × 30 = 2400 **and** 25 × 30 = 750
6(c) 20 000 ft^3	B1	
6(d) 1.55×10^8	B1	

7(a)(i) Explanation, e.g. 'data is grouped', 'not raw data', 'table only gives group information' '15 days with less than 6mm of rain, but we don't know if there was no rain on any of these days', 'only results between 0 – 6mm', 'doesn't give days of 0mm rain, it has 0 – 6mm'	E1	Allow, e.g. 'because it shows $0 \leq r < 6$ is equal to 15', 'doesn't say if the 15 belongs to 0 or to less than 6', 'the table doesn't give you exactly how many mm in the days' Do not accept, e.g. 'Can't tell' without further explanation as to why, 'doesn't give you enough information', 'it's not accurate enough', 'no column with daily rainfall with no rain option', 'table only shows daily rainfall, not the number of days without rain', 'doesn't show if it actually rained or not', 'no section for 0 rainfall', 'doesn't show a day in the table when there is no rain', 'doesn't say if the 15 belongs to 0 or to the 6' 'no record of the number of days it did not rain'
7(a)(ii) Mid points 3, 9, 15, 21 $3\times15 + 9\times11 + 15\times3 + 21\times1$ $(45 + 99 + 45 + 21 = 210)$ $\div 30$ 7 (mm)	B1 M1 m1 A1	Note: Check the table FT their mid points provided they fall within the classes including both bounds. FT if 1 slip in one of 'their midpoints', used outside the tolerance of bounds for M1, m1 only FT from M1 for intention 'their 210'/30 Following correct working On FT from incorrect mid points allow rounding or truncation of 'their final answer'
7(b) 25×4.4 $(= 110)$ $\div 30$ 3.67 (mm)	M1 m1 A2	 CAO A1 for $3\frac{2}{3}$ (mm) or 3.6(66...mm) which allows 3.6(....), 3.7 (mm) Allow A1 for a correct FT from an error in calculating 25×4.4 provided rounding to give 3 significant figures required and correct (e.g. 25×4.4 as 120 leading to an answer of 4 is A0)
8(a) 30 cm	B1	

8(b) For all methods		**If an evaluation is given with incorrect units, award A0 on the first occasion then FT**
8(b) (Cost to make 150 boxes) (150 ÷ 25) ÷ 2 or 6 × 50 or equivalent (£)3 or 300(p)	M1 A1	
(Cost of the chocolates) 150 × 4 × 7 or 600 × 7 or equivalent 4200(p) or (£) 42	M1 A1	
(Profit) 0.2 × (3 + 42) or equivalent (£) 9 or 900(p)	M1 A1	FT 0.2 × ('their cost of boxes + their cost of chocolates') ISW
8(b) <u>Alternative method 1</u>: *(Each box of chocolates costs) 4 × 7 + 50 ÷ 25* *30(p)*	*M1* *A1*	
(Each box of chocolates sells for) 30 × 1.2 *36(p)*	*M1* *A1*	*FT 'their derived 30p' (including omitting the box)*
(Profit) (36 – 30) × 150 *(£)9 or 900(p)*	*M1* *A1*	*FT 150 × 'individual (sales – cost)'* *ISW*
8(b) <u>Alternative method 2</u>: *(Each box of chocolates costs) 4 × 7 + 50 ÷ 25* *30(p)*	*M1* *A1*	
(Profit for one box of chocolates) 30 × 0.2 *6(p)*	*M1* *A1*	*FT 'their derived 30p' (including omitting the box)*
(Profit) 6 × 150 *(£)9 or 900(p)*	*M1* *A1*	*FT 150 × 'their profit per box'* *ISW*
8(b) <u>Alternative method 3</u>: *(25 boxes of chocolates cost) 4 × 7 × 25 + 50* *750 (p) or (£)7.50*	*M1* *A1*	
(Profit for 25 boxes of chocolates) 7(.)50 × 0.2 *(£)1.50 or 150(p)*	*M1* *A1*	*FT 'their derived 7(.)50' (including omitting the box)*
(Profit) 1(.)50 × 150 ÷ 25 *(£)9 or 900(p)*	*M1* *A1*	*FT 'their profit for 25 boxes' × 150 ÷ 25* *ISW*
8(b) <u>Alternative method 4</u>: *(25 boxes of chocolates cost) 4 × 7 × 25 + 50* *750 (p) or (£)7.50*	*M1* *A1*	
(Total cost to make) 7(.)50 × 150 ÷ 25 *(£)45 or 4500(p)*	*M1* *A1*	*FT 'their derived 7(.)50' (including omitting the box)*
(Profit) 45 × 0.2 or 4500 × 0.2 *(£)9 or 900(p)*	*M1* *A1*	*FT 0.2 × 'their total cost to make'* *ISW*
8(b) <u>Alternative method 5</u>: *(Each box of chocolates costs) 4 × 7 + 50 ÷ 25* *30(p)*	*M1* *A1*	
(Total cost to make) (0.)30 × 150 *(£)45 or 4500(p)*	*M1* *A1*	*FT 'their derived 30p' (including omitting the box)*
(Profit) 45 × 0.2 or 4500 × 0.2 *(£)9 or 900(p)*	*M1* *A1*	*FT 0.2 × 'their total cost to make'* *ISW*

9. $4.2 \times (3 \div 2)$ or 4.2×1.5 or $4.2 \div \frac{2}{3}$ (Height) 6.3 (cm) $3.9 \div (3 \div 2)$ or $\frac{3.9}{1.5}$ or $3.9 \times \frac{2}{3}$ (Pin length) 2.6 (cm)	M1 A1 M1 A1	Do not penalise any answers reversed in the answer space
10(a) $t \leq 12$: **46**; $t \leq 16$: **52**; $t \leq 20$: **54**	B1	
10(b) Correct cumulative frequency diagram drawn, with points joined with a straight line or a curve	B2	FT only **cumulative** entries from (a) B1 for either • correct plots (but not joined or with spurious or incorrect straight line or curve), or • 'their plots' joined provided 5 or 6 plots are correct
10(c) 23 (patient appointments)	B2	STRICT FT 'their **cumulative** graph', i.e. correctly evaluated '60 – their 37' B1 for sight of 60 – 'their 37' If 'their graph' is **not** cumulative or shows bars, FT for '60 – their 37' provided a unique reading for 10 minutes (60 – 'their reading at 10 minutes) but award B1 only (not B2) If no marks, award SC1 for 23 (patient appointments) calculated or unsupported, when not from 'cumulative frequency graph', e.g. (18/2 + 6 + 2 + 6 =) 23
10(d) $\frac{6}{60}$ (× 100) or (100 ×) 1 - $\frac{54}{60}$ (× 100) 10 (%)	M1 A1	FT 'their 54' (reading for t ≤ 20) provided > 28 Do not accept an answer with incorrect units, e.g. '10 people'
10(e) Difference in medians 3 (minutes)	B2	Allow if calculated from the information in the table Must be correct to the nearest minute for 'their cumulative frequency graph' FT 'their **cumulative** frequency graph' Do not accept an answer from incorrect working, including without a cumulative graph seen B1 for either • sight of Monday median 8.3 to 8.7 (minutes), or • an answer for the difference in the medians in the range 2.8 to 3.2 (minutes) (from working with Monday median in the range 8.3 to 8.7 minutes) Apply the same tolerance of ±0.2 (minutes) when following through from 'their graph' On FT, if 'their answer' ≠ whole number of minutes, it must be rounded to the nearest minute

10(f) Sight of any one of: • $\frac{4 + 24 + 18}{60}$ (× 100) • $\frac{46}{60}$ (× 100) • 0.8 × 60 or equivalent • 0.2 × 60 or equivalent Conclusion, 'no (target not met)' AND a correct evaluation: • 76.666(%) rounded or truncated • 48 (appointments) • 12 and (60 – 12 =) 48 (appointments) OR 12 and (6 + 2 + 6 =) 14 (appointments)	M1 A2	FT 'their 46' from an incorrect **cumulative** total in (a) (i.e. 'their value in the table for t ≤ 12') FT for correctly evaluated use of 'their 46' Allow for sight of 46 ÷ 60 = 0.76(…) or 100 × 46 ÷ 60 = 76(%) Allow, e.g. 'over 0.7' or 'over 70(%) only **provided** the correct conclusion 'no' is given If 48 is not evaluated, accept the time from 'their graph' for 48 appointments instead A1 for a correct evaluation: • 76.(66...%) rounded or truncated • 'over 70%' or 'over 0.7' • 0.76(...) or 0.77 • 48 (appointments) • 12 (appointments)