GCSE MARKING SCHEME

AUTUMN 2022

GCSE
MATHEMATICS – NUMERACY
UNIT 1 – FOUNDATION TIER
3310U10-1

INTRODUCTION

This marking scheme was used by WJEC for the 2022 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 2022 MARK SCHEME

<table>
<tr><th>Unit 1: Foundation Tier</th><th>Mark</th><th>Comments</th></tr>
<tr><td>1. Rounded values

<table><tr><td>Item</td><td>Cost (£)</td></tr><tr><td>Dress</td><td>200</td></tr><tr><td>Shoes</td><td>40 or 39</td></tr><tr><td>Bag</td><td>30 or 28</td></tr><tr><td>Jewellery</td><td>20 or 19</td></tr></table>
Correct total given

200 + 40 + 30 + 20 = (£)290
200 + 40 + 30 + 19 = (£)289
200 + 40 + 28 + 20 = (£)288
200 + 40 + 28 + 19 = (£)287
200 + 39 + 30 + 20 = (£)289
200 + 39 + 30 + 19 = (£)288
200 + 39 + 28 + 20 = (£)287
200 + 39 + 28 + 19 = (£)286</td><td>B2

B1</td><td>Award B2 for all 4 values correctly rounded

Award B1 for 2 or 3 values correctly rounded

FT ‘their approximate’ values if at least B1 previously awarded.

Allow an equivalent calculation that implies the same conclusion
e.g. the shoes, bag and jewellery are less than (£)100.

If no marks, award SC2 for:
• total given as £285.57 then rounded to £286 or £290.
• a correct total given using one rounded and 3 truncated values or all 4 truncated values
Note truncated values are: 199, 38, 27, 18 (=£282)

If no marks, award SC1 for:
• total given as £285.57.
• sight of one rounded and 3 truncated values or all 4 truncated values
e.g sight of 199, 38, 27 &18

If no working shown, award SC1 for a whole number answer in the range (£)286 to (£)290.</td></tr>
<tr><td>2(a) one hundred and ninety-five thousand</td><td>B1</td><td>Do not accept
• one hundred thousand and ninety-five thousand
• 195 thousand</td></tr>
<tr><td>2(b) Caernarfon Castle</td><td>B1</td><td>Allow (+)0.2(%) as indication of Caernarfon Castle</td></tr>
<tr><td>2(c) 255949 + 260153
516 102</td><td>M1
A1</td><td></td></tr>
<tr><td>2(d) 452 007 – 319 131
132 876</td><td>M1
A1</td><td>Allow 319 131 – 452 007
Allow -132 876</td></tr>
</table>

2(e) Yes and valid reason given e.g. 'Yes, because 455 428 is nearly 500 000' 'Yes, because if you round up 455 428 to the nearest hundred thousand it is 500 000' 'Yes, as 455 428 is closer to half a million than 400 000' 'Yes, because rounding to the nearest 100 000 would give you half a million'	E1	Allow e.g. 'Yes, because they had over 450 000' 'Yes, as only about 50 000 away from half a million' 'Yes, because 455 428 is <u>nearly</u> half a million' 'Yes, as you would round up to the nearest 50 000' 'Yes, as half a million is 500 000' 'No because it is nearly 45 000 short' 'No as it was only 455 428 so that's not quite half a million' 'No, because it is closer to 450 000' 'No because it is 460 000' 'No, because it is about 50 000 below' 'No, because it is just over 450 000' 'No, because the number is below 500 000 so it isn't half a million' 'No, because half a million is 500 000 but the number is 455 428' 'No because it would be in the 500 000 so he is wrong because 455 428 is less than half a million' Do not accept e.g. 'Yes, because 455 428 is <u>about</u> half a million' – this is the statement given 'No, because it's only 455 428' 'No because 455 428 isn't close to half a million as it is in the 4s' 'No, because they got 455 428'
2(f) Evidence of counting squares **inside** shape Answer in range 14 to 20 Correct evaluation of 'their area' × 4 and manager correct Or 48 ÷ 4 = 12 and manager correct	M1 A1 E1	 FT if M1 awarded for a correct evaluation of 'their area' × 4 and conclusion made consistent with their answer OR 'their area' is in the range 13 to 22 with 'their area' × 4 correct and manager correct
<u>Alternative method</u> *Evidence of splitting each square into 4* *Answer in range 56 to 80* *Correct evaluation (conclusion) of the area with manager correct*	*M1* *A1* *E1*	*Or for counting up in 4s up to at least 20* *Must not come from incorrect work* *FT if M1 awarded with conclusion made consistent for 'their area'* *OR* *'their area' is in the range 52 to 88 with correct conclusion*
3. 29 16 35	B4	Answer box takes precedence If B4 not awarded: Award B1 for 29 selected Award B1 for 16 selected Award B2 for 35 selected or award B1 for 21 selected (if both 21 **and** 35 given, award B1) Penalise -1 if all the 3 two-digit numbers are correct but not in the correct order. Allow unambiguous answers for each statement written in each box (ie using 12 digits)

4(a) 7	B1	
4(b) 9	B1	
4(c) No and valid reason given e.g. 'No because you add two onto each of the design numbers' 'No because it is the design + 2' 'No because that rule doesn't work for Design 2' 'No because Design 2 uses 4 pieces (not 6)' 'No, because for design 2, 2 × 3 = 6, design 3, 3×3 = 9 and both totals are not correct' 'No, because design 3 has 5 pieces of metal which shows it is not multiplied by 3' 'No because design 3 would be 9 and not 5' 'No because the rule is n + 2 not n × 3'	E1	Ignore any further spurious comments. Do not accept 'No, because the designs add one more piece of metal each time' 'No because you add on 1 each time' Do not accept values from incorrect number work e.g. 'No because design 3 would be 6 and not 5'
4(d) 180 – (55 + 90) or 90 - 55 35(°)	M1 A1	
4(e) (30 – 14) ÷ 2 (£)8	M1 A1	May be seen in stages Allow sight of embedded 8 for M1, e.g. • 2 × 8 + 14 = 30 • 2 × 8 = 16 + 14 = 30 Award M1 for sight of two correctly evaluated improving trials e.g. 2 × 6 + 14 = 26 AND 2 × 7 + 14 = 28 Answer line takes precedence – do not award A1 if answer line states £30 If answer line is blank, accept embedded answers provided that it is not contradicted *(e.g. if they say cost of materials is 30)*

5. (Gerry already has) 800 ÷ 10 × 3 (£)240 (Manager gives 25/100 × 800) (£)200 (Need to save) 800 – 240 - 200 or 800 – (240 + 200) = (£)360 (Number of weeks) 5	M1 A1 B1 M1 A1 B2	 FT 'their derived 240' AND 'their derived 200'. FT 'their derived 360' if not a multiple of 80 Award B2 only if there are no errors in the required working. Award B1 for any of the following: • 360 ÷ 80 (=4.5) • (360 – 4 × 80 =) 40 • (360 – 5 × 80 =) -40 • (4 × 80 =) 320 • (5 × 80 =) 400 • 4 × 80 AND 5 × 80 or equivalent • *An answer of 4 weeks from using £360* • A correct FT answer where 'their 360' is a multiple of 80
<u>Alternative method for the last 4 marks</u> *(Total received 240 + 200 =) (£)440* *(Number of weeks) 5*	 *B1* *B3*	 *FT 'their derived 240' and 'their derived 200'* *FT 'their derived 440' if not a multiple of 80 for B3, B2 or B1* *Award B3 only if there are no errors in the required working.* *Award B2 for any of the following:* • *(440 + 4 × 80 =) 760 (multiple below 800)* • *(440 + 5 × 80 =) 840 (multiple above 800)* • *440 + 4 × 80 AND 440 + 5 × 80 or equivalent* • *for an answer of 4.5 weeks* • *A correct FT answer where 'their 440' is a multiple of 80* *Award B1 for any of the following:* • *440 + 4 × 80 or equivalent (the week below 800)* • *440 + 5 × 80 or equivalent (the week above 800)* • *An answer of 4 weeks from use of £440* • *An incorrect FT answer (number of weeks) from 'their 440' counting up correctly in 80s to 2 80s below or at least 2 80s above*
<u>Alternative method for the first 4 or 5 marks</u> if combine the percentages (or equivalent) *(Total percentage given) 25% + 30% or equivalent* *55% or equivalent* *(Total received) 55/100 × 800* *(£)440* *(Need to save 800 – 440=) (£)360*	 *M1* *A1* *M1* *A1* *B1*	 *FT 'their derived 55%'* *FT 800 - 'their derived 440'*

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.
6(a) 20:40	B1	
6(b) 10(:)10 (a.m.) or 'ten past ten' or equivalent	B3	Allow use of decimal point, a gap, no gap as a 'spacer' in time throughout Accept times given in 24hr or a.m. format throughout. B2 for any one of the following: • sight of (0)9(:)48 (tram) • sight of (0)9(:)70 • arrives 5 minutes early (before 10(:)15) • an answer of 10(:)10 p.m. • use of multiples of 12 minutes from 8 a.m. with 8(:)12, 8(:)24 and 8(:)36 seen with an error in working but 22 mins correctly added to their final multiple (which must be between 09:36 and 09:53 inclusive) B1 for any one of the following: • use of multiples of 12 minutes from 8 a.m. with 8(:)12, 8(:)24 and 8(:)36 seen • (tram at) 9(:)00 • 10(:)00 with attempt to subtract 12 minutes • (10:00 tram arrives at) 10(:)22 • 60 ÷ 12 (= 5) or 5 × 12 = 60 • 5 trams per hour (until 10:00) An answer of 10(:)37 is awarded B0 unless any of criteria for B2 or B1 met

7(a) (Area of the small picture is) 10×5 OR (Area of the large picture is) 40×15	M1	
(Area of the small picture is) 50 (cm^2) (Area of the large picture is) 600 (cm^2)	A1 A1	May be implied in further working May be implied in further working
(Cost to print large picture is) $\frac{600}{50} \times 2(.00)$ OR For a full proportion **method** calculated correctly or or with working shown, e.g. $50cm^2$ is (£)2, $100cm^2$ is 2×2 (=£4), $150cm^2$ is $2 + 2 \times 2$ and $600cm^2$ is $4 \times (2 + 2 \times 2)$	M2	May be seen in stages FT 'their 10×5' and FT 'their 40×15' M1 for any one of the following: • (Cost to print $1cm^2$) 2(.00) ÷ 50 or 4(p) or (£)0.04 • 600 ÷ 50 or (600 ÷ 50 =) 12 or $12 \times 50 = 600$ • 'their cost to print per $1cm^2$' × 'their 40×15' • Proportion method that would lead to a correct response, but includes one error, e.g. $50cm^2$ is (£)2, $100cm^2$ is (£)4, $150cm^2$ is *without working* '*(£)5*' with $600cm^2$ is (4×5 = £) 20 • FT for 'their 50' and 'their 600' (including if perimeters or semi-perimeters)
(£)24 or 2400(p)	A1	Only FT from previous M2 If units are given they must be correct
7(a) Alternative method 1 *(To find the number of small pictures to cover area of the large picture) 40 ÷ 10 AND 15 ÷ 5*	*M1*	*Allow 40 ÷ 5 AND 15 ÷ 10*
4 (up) and 3 (across)	*A2*	*May be shown on a diagram* *Allow 8 and 1.5 (from 40 ÷ 5 = 8 and 15 ÷ 10= 1.5)* *A1 for any one of the 4 possible divisions accurately evaluated*
(Cost to print the large picture) *4 × 3 × (£) 2 or equivalent*	*M2*	*FT 'their 4 across and 3 up' provided 2 different values ≠ 1* *Allow 8 × 1.5 × (£)2* *M1 for appropriate sight of 4 × 3 or 8 × 1.5 including if embedded in other working*
(Cost to print large picture) *(£)24 or 2400(p)*	*A1*	*FT from M2 only* *If units are given they must be correct*
7(b) $(10 + 5 + 10 + 5) \times (0.)40$ or $30 \times (0.)40$ or $10 \times (0.)40 + 5 \times (0.)40 + 10 \times (0.)40 + 5 \times (0.)40$ or $4 + 2 + 4 + 2$ or $400 + 200 + 400 + 200$	M2	M1 for sight of any one of the following: • $10 + 5 + 10 + 5$ (= 30 cm) • $(10 + 5) \times (0.)40$ (= £6 or 600p) • $10 \times (0.)40 + 5 \times (0.)40$ (=£6 or 600p) • (2, 4,) 2 and 4 (check diagram) • (200, 400,) 200 and 400 (check diagram) • ('their height' + 'their width') × 2 x (0.)40
(£)12 or 1200(p)	A1	CAO. If units are given they must be correct If no marks, award SC1 for an answer of (£)44 or 4400(p) (working with the larger picture)

8. Compare **small** with **large** using same <u>volume</u>, e.g.

- Volume of 4 small cartons
- Cost of 4 small cartons
- Cost of 500ml of large carton

OR

Compare **medium** with **large** using <u>volume and cost</u>, e.g.

- Cost for 2400ml medium cartons
- Cost of 1000ml large carton

B1

Accept for 'their 4' from 2000 ÷ 500
Ignore incorrect units given

4 small	vol	4 × 500	2000ml
4 small	cost	4 × (0.)40	£1.6(0) or 160p
500ml large	cost	2(.)50 ÷ 4	£0.625 or 62.5p
2400ml medium	cost	2 × 1(.)20	£2.40 or 240p
1000ml large	cost	2(.)50 ÷ 2	£1.25 or 125p

Compare the **small** with the **medium** using <u>cost</u>, e.g.

- Volume for £1.20 in small cartons
- Cost of 3 small cartons
- Volume of 1/3 of a medium carton
- Cost of 400 ml medium carton

B1

Accept for 'their 3' from 1200 ÷ 400
Ignore incorrect units given

£1.20 in small	vol	3 × 500	1500 ml
3 small	cost	3 × (0.)40	£1.20 or 120p
1/3 medium	vol	1200 ÷ 3	400 ml
400 ml medium	cost	1(.)20 ÷ 3	£0.4(0) or 40p

Conclusion 'small' based on accurate calculations from full comparison

B1

Only FT from B1, B1
Must have consistent correct units or allow no units given

<u>8. Alternative method 1</u>

Method of comparing all 3 cartons, e.g.
ml per 10p or p per 100ml or £ per 6000 ml

M2

Ignore incorrect units given
M1 for attempt to compare at least 2 of the 3 cartons

	Small	*Medium*	*Large*
ml for 10p	*500 ÷ 4 = 125*	*1200 ÷ 12 = 100*	*2000 ÷ 25 = 80*
p per 100 ml	*40 ÷ 5 = 8*	*1(.)20 ÷ 12 = 10*	*2(.)50 ÷ 20 = 12.5 Allow 12 or 13*
£ per 6000ml	*12 × 0(.)40 = 4.80*	*5 × 1(.)20 = 6*	*3 × 2(.)50 = 7.50*

Conclusion 'small' based on accurate calculations from full comparison

A1

Only FT from M2
Must have consistent correct units or allow no units given
From division calculations, allow rounding and truncation provided it does not impact on being able to compare

9(a)(i) (175 – 55) ÷ 8 or 120 ÷ 8 (£) 15	M1 A1	May be seen in stages CAO. Allow an embedded answer of 15, e.g. 8 × 15 = 120
9(a)(ii) (Total including VAT is) 175 + 175 × 0.2(0) or 175 × 1.2(0) or equivalent (£) 210	M2 A1	May be seen in stages M1 for (VAT) 175 × 0.2(0) or 17.5 + 17.5 (= 35) or equivalent If no marks, award • either SC2 for total including VAT correctly evaluated starting with charge 55, 15 or 'their 15' from (b)(i), i.e. 66, 18 or correctly evaluated 'their 15' × 1.20 • or SC1 for a calculation for total including VAT starting with charge 55, 15 or 'their 15' from (b)(i), i.e. 55 × 1.20, 15 × 1.20 or 'their 15' × 1.20 or equivalents
9(b)(i) 'No' selected or unambiguous implied with reason, e.g. 'no correlation' 'no pattern' '(points are) random' 'no trend' 'number of leaves is not affected by height'	E1	Allow, e.g. 'No' with 'different flowers have different (numbers of) leaves' 'scattered' ' the data (or answers) are not consistent' Do not accept, e.g. 'No' with 'there isn't a leaf with height 6cm' 'it does not show on the graph' 'there is no data for 6' 'it doesn't say how many there are' 'not enough research' 'sample too small' 'some points close together' 'data is not reliable'
9(b)(ii) 7.5 cm	B1	
9(b)(iii) 17.5 – 13 or 9 × 0.5 4.5 (cm)	M1 A1	Allow 13 – 17.5 Answer space takes precedence Allow FT -4.5 (cm) from 13 – 17.5 If no marks, award SC1 for the difference correctly evaluated provided either 17.5 or 13 is correct
9(b)(iv) 80(%)	B2	Answer space takes precedence B1 for sight of any of the following: • 8/10 • 8 ÷ 10 • (Including 23, 100 × 9 ÷ 10 =) 90 (%) B0 for '8 out of 10'

10. Method 1 for 200 jars (Cost of 200 jars) 200 × (0.)23 OR (Sales of 200 jars of jam) 200 × 1(.)60	M1	
(Cost of 200 jars) 4600(p) or (£)46 (Sales of 200 jars of jam) 32000(p) or (£)320	A1 A1	
(Cost 200 jars + jam) (£94 +£46=) (£)140 or 14000(p)	B1	FT £94 + 'their derived £46'
(Profit £320 - £140 =) 18000(p) or (£)180	B1	If units are given they must be correct FT 'their derived £320' – 'their derived £140'
10. Method 2 for 200 jars *(Cost of jam for 200 jars) 200 × (1(.)60 – 0(.)23)*	*M2*	*M1 for 1(.)60 – 0(.)23 or (£)1.37 or 137(p)*
(=) £) 274 or 27400(p)	*A2*	*A1 for 200 × 1(.)37*
(Profit £274 - £94 =)18000(p) or (£)180	*B1*	If units are given they must be correct *FT 'their derived £274' – £94*
10. Method for 1 jar *(Cost of ingredients for 1 jar of jam) 94(00) ÷ 200* *47(p) or (£)0.47*	*M1* *A1*	
(Cost of jam and jar) (23p + 47p =) 70(p) or (£)0.7(0)	*B1*	*FT 'their derived 47p' + 23p*
(Profit for 1 jar of jam £1.60 – 70p =) 90(p) or(£)0.9(0)	*B1*	*FT £1.60 - 'their derived 70p'* *May be seen or implied in later working*
(Profit for 200 jars of jam) 18000(p) or *(£)180*	*B1*	If units are given they must be correct *FT 'their derived 90p'*