



GCSE MARKING SCHEME

AUTUMN 2022

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

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

Unit 1: Intermediate Tier	Mark	Comments
1(a) (Area of the small picture is) 10×5 OR (Area of the large picture is) 40×15 (Area of the small picture is) $50 \text{ (cm}^2\text{)}$ (Area of the large picture is) $600 \text{ (cm}^2\text{)}$ (Cost to print large picture is) $\frac{600 \times 2(.00)}{50}$ 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 $4 \times (2 + 2 \times 2)$ (£)24 or 2400(p)	M1 A1 A1 M2 A1	May be implied in further working May be implied in further working 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) $2(.00) \div 50$ or 4(p) or (£)0.04 $600 \div 50$ or $(600 \div 50 =) 12$ or $12 \times 50 = 600$ 'their cost to print per 1cm^2' $\times$ '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 <i>without working</i> '(£)5' with 600cm^2 is $(4 \times 5 = £) 20$ - FT for 'their 50' and 'their 600' (including if perimeters or semi-perimeters) Only FT from previous M2 If units are given they must be correct
<u>1(a) Alternative method 1</u> (To find the number of small pictures to cover area of the large picture) $40 \div 10$ AND $15 \div 5$ 4 (up) and 3 (across) (Cost to print the large picture) $4 \times 3 \times (£) 2$ or equivalent (Cost to print large picture) (£)24 or 2400(p)	M1 A2 M2 A1	Allow $40 \div 5$ AND $15 \div 10$ May be shown on a diagram Allow 8 and 1.5 (from $40 \div 5 = 8$ and $15 \div 10 = 1.5$) A1 for any one of the 4 possible divisions accurately evaluated FT 'their 4 across and 3 up' provided 2 different values $\neq 1$ Allow $8 \times 1.5 \times (£)2$ M1 for appropriate sight of 4×3 or 8×1.5 including if embedded in other working FT from M2 only If units are given they must be correct
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.

1(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 $400 + 200 + 400 + 200$ (£)12 or 1200(p)	M2 A1	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') $\times 2 \times (0.)40$ 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)
2(a) 20:40	B1	
2(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 • $60 \div 12 (= 5)$ or $5 \times 12 = 60$ • 5 trams per hour (until 10:00) An answer of 10(:)37 is awarded B0 unless any of criteria for B2 or B1 met

3(a) 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 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 Conclusion ‘small’ based on accurate calculations from full comparison	B1 Accept for ‘their 4’ from $2000 \div 500$ Ignore incorrect units given <table><tr><td>4 small</td><td>vol</td><td>4×500</td><td>2000ml</td></tr><tr><td>4 small</td><td>cost</td><td>$4 \times (0.)40$</td><td>£1.6(0) or 160p</td></tr><tr><td>500ml large</td><td>cost</td><td>$2(.)50 \div 4$</td><td>£0.625 or 62.5p</td></tr><tr><td>2400ml medium</td><td>cost</td><td>$2 \times 1(.)20$</td><td>£2.40 or 240p</td></tr><tr><td>1000ml large</td><td>cost</td><td>$2(.)50 \div 2$</td><td>£1.25 or 125p</td></tr></table> B1 Accept for ‘their 3’ from $1200 \div 400$ Ignore incorrect units given <table><tr><td>£1.20 in small</td><td>vol</td><td>3×500</td><td>1500 ml</td></tr><tr><td>3 small</td><td>cost</td><td>$3 \times (0.)40$</td><td>£1.20 or 120p</td></tr><tr><td>1/3 medium</td><td>vol</td><td>$1200 \div 3$</td><td>400 ml</td></tr><tr><td>400 ml medium</td><td>cost</td><td>$1(.)20 \div 3$</td><td>£0.4(0) or 40p</td></tr></table> B1 Only FT from B1, B1 Must have consistent correct units or allow no units given	4 small	vol	4×500	2000ml	4 small	cost	$4 \times (0.)40$	£1.6(0) or 160p	500ml large	cost	$2(.)50 \div 4$	£0.625 or 62.5p	2400ml medium	cost	$2 \times 1(.)20$	£2.40 or 240p	1000ml large	cost	$2(.)50 \div 2$	£1.25 or 125p	£1.20 in small	vol	3×500	1500 ml	3 small	cost	$3 \times (0.)40$	£1.20 or 120p	1/3 medium	vol	$1200 \div 3$	400 ml	400 ml medium	cost	$1(.)20 \div 3$	£0.4(0) or 40p
4 small	vol	4×500	2000ml																																		
4 small	cost	$4 \times (0.)40$	£1.6(0) or 160p																																		
500ml large	cost	$2(.)50 \div 4$	£0.625 or 62.5p																																		
2400ml medium	cost	$2 \times 1(.)20$	£2.40 or 240p																																		
1000ml large	cost	$2(.)50 \div 2$	£1.25 or 125p																																		
£1.20 in small	vol	3×500	1500 ml																																		
3 small	cost	$3 \times (0.)40$	£1.20 or 120p																																		
1/3 medium	vol	$1200 \div 3$	400 ml																																		
400 ml medium	cost	$1(.)20 \div 3$	£0.4(0) or 40p																																		
<u>3(a) Alternative method 1</u> Method of comparing all 3 cartons, e.g. ml per 10p or p per 100ml or £ per 6000 ml Conclusion ‘small’ based on accurate calculations from full comparison	M2 Ignore incorrect units given M1 for attempt to compare at least 2 of the 3 cartons <table><tr><td></td><td>Small</td><td>Medium</td><td>Large</td></tr><tr><td>ml for 10p</td><td>$500 \div 4 = 125$</td><td>$1200 \div 12 = 100$</td><td>$2000 \div 25 = 80$</td></tr><tr><td>p per 100 ml</td><td>$40 \div 5 = 8$</td><td>$1(.)20 \div 12 = 10$</td><td>$2(.)50 \div 20 = 12.5$ Allow 12 or 13</td></tr><tr><td>£ per 6000ml</td><td>$12 \times 0(.)40 = 4.80$</td><td>$5 \times 1(.)20 = 6$</td><td>$3 \times 2(.)50 = 7.50$</td></tr></table> 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		Small	Medium	Large	ml for 10p	$500 \div 4 = 125$	$1200 \div 12 = 100$	$2000 \div 25 = 80$	p per 100 ml	$40 \div 5 = 8$	$1(.)20 \div 12 = 10$	$2(.)50 \div 20 = 12.5$ Allow 12 or 13	£ per 6000ml	$12 \times 0(.)40 = 4.80$	$5 \times 1(.)20 = 6$	$3 \times 2(.)50 = 7.50$																				
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£ per 6000ml	$12 \times 0(.)40 = 4.80$	$5 \times 1(.)20 = 6$	$3 \times 2(.)50 = 7.50$																																		
3(b) $300 \times 30 \div 12$ or 300×2.5 or 30×25 or $2 \times 300 + \frac{1}{4} (2 \times 300)$ or $600 + 150$ or equivalent 750(ml)	M1 May be seen in stages A1 CAO																																				

4(a) (Area of lawn) $\frac{1}{2} \times 3 \times 4 + \frac{1}{2} \times 5 \times 12$ (To find cost of seed) $\times (0.)30$ (£) 10.8(0) or 1080(p)	M2 (= $6 + 30 = 36 \text{ m}^2$) M1 for any one of the following: - sight of $\frac{1}{2} \times 3 \times 4$ and $\frac{1}{2} \times 5 \times 12$ $\frac{1}{2} \times 3 \times 4 + \dots$ $\dots + \frac{1}{2} \times 5 \times 12$ - Sight of either area correct, 6 or 30 m1 FT from M1 A1 FT from M1, m1 provided it is from the sum of 2 areas of triangles Allow if FT correctly evaluated area rounded up to the nearest m^2 If units are given they must be correct If no marks, award SC1 for an answer of (£)21.60 or 2160(p)
4(b)(i) $(175 - 55) \div 8$ or $120 \div 8$ (£) 15	M1 A1 May be seen in stages CAO. Allow an embedded answer of 15, e.g. $8 \times 15 = 120$
4(b)(ii) (Total including VAT is) $175 + 175 \times 0.2(0)$ or $175 \times 1.2(0)$ or equivalent (£) 210	M2 May be seen in stages M1 for (VAT) $175 \times 0.2(0)$ or $17.5 + 17.5 (= 35)$ or equivalent A1 If no marks, award <u>either</u> 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' $\times 1.20$ <u>or</u> 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' $\times 1.20$ or equivalents
4(c)(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'
4(c)(ii) 7.5 cm	B1
4(c)(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

4(c)(iv) 80(%)	B2	Answer space takes precedence B1 for sight of any of the following: • 8/10 • $8 \div 10$ • (Including 23, $100 \times 9 \div 10 =$) 90 (%) B0 for '8 out of 10'
5(a) (North orchard, number of pear trees is) $3 \times 35 \div (4 + 3)$ or 3×5 or equivalent 15 (pear trees) (West orchard number of pear trees is 2×15) 30 (pear trees) (West orchard number of cherry trees is) $11 \times 30 \div 5$ 66 (cherry trees)	M1 A1 B1 M1 A1	FT 'their derived 15' FT 'their derived number of pear trees' Allow M1 for a final answer of 88 (cherry trees from use of 40 apple trees as pear trees), but A0 FT answer must be evaluated correctly and lead to a whole number
5(b) (Mass of apples to make juice) 5280 $\div 6$ $\div 2.2$ 400 (kg) (Number of litres of juice produced) $400 \times 2 \div 5$ or $2 \div (5 \div 400)$ or $2 \times \frac{400}{5}$ 160 (litres)	M1 M1 A2 M1 A1	Method may be seen in either order M0 for statement '1/6 of 5280' without calculation Ignore incorrect units given May be seen or implied in later working A1 for any one of the following: • $(5280 \div 2.2 =)$ 2400 • $(5280 \div 6 =)$ 880 • a correct evaluation of 'their 2400' $\div 6$ • a correct evaluation of 'their 880' $\div 2.2$ FT 'their derived 400(kg)' (not 5280) If 'their derived 400' is used as g (rather than kg) allow M1 for 'their derived 400' $\times 2 \div 5000$ or $2 \div (5000 \div \text{'their derived 400'})$, but A0
<u>5(b) Alternative method</u> (Mass of apples used to make juice) $5280 \div 6$ 880 (lbs) (Mass of apples in 2 litres) 5×2.2 11 (lbs) (Number of litres of juice produced) $2 \times 880 \div 11$ 160 (litres)	M1 A1 M1 A1 M1 A1	FT 'their derived 880' and 'their derived 11'
5(c)(i) <u>Method 1 for 200 jars</u> (Cost of 200 jars) $200 \times (0.)23$ OR (Sales of 200 jars of jam) $200 \times 1(.)60$ (Cost of 200 jars) 4600(p) or (£)46 (Sales of 200 jars of jam) 32000(p) or (£)320 (Cost 200 jars + jam) (£94 + £46=) (£)140 or 14000(p) (Profit £320 - £140 =) 18000(p) or (£)180	M1 A1 A1 B1 B1	FT £94 + 'their derived £46' If units are given they must be correct FT 'their derived £320' – 'their derived £140'

7(a) Whiskers at 3 m and 22 m Unambiguous values or box with LQ 5 m and UQ 20 m Median at 15 m	B1 B1 B1	Ignore if lines omitted from the ends of the whiskers Must be the least and greatest values shown May be seen in working, must be clearly LQ and UQ Check cumulative frequency diagram If not clearly labelled in working or on the graph, they must be no other values given between - the least and the LQ, and - the greatest and the UQ May be seen in working, must be clearly the median Check cumulative frequency diagram If not an unambiguous unique line or point, i.e. not clearly labelled in working or on the graph, allow for a line (or point) indicated that is not the least or greatest value shown Only if B1 B1 B1 awarded, <u>penalise -1</u> if a correct format for a box-and-whisker diagram is not shown
7(b)(i) 0.75×68 or equivalent 51 (yachts)	M1 A1	Answer space takes precedence If no marks, award SC1 for sight of 17 (from 0.25×68)
7(b)(ii) Conclusion 'Eog' with sight of (Eog IQR $20 - 5 = 15$ (m) AND (Clwyd IQR $18 - 10 = 8$ (m)	B2	FT 'their UQ – LQ' from (a) box-and-whisker diagram B1 for either IQR correct
7(b)(iii) Conclusion 'Can't tell' with reason, e.g. 'only know that 25% of yachts in Clwyd Marina are greater than 18m' 'we don't know if any of the yachts in Clwyd Marina are greater than 22(metres, the longest in Eog Marina)' 'we don't know if a yacht in Clwyd Marina is greater than 22(metres)' 'it doesn't say maximum length of Clwyd Marina's results'	E1	Ignore any additional incorrect or spurious statements Allow 'Can't tell' with a reason, e.g. 'no raw data' 'don't know this information' 'doesn't show anywhere the biggest yacht in Clwyd Marina' 'we are only given some of the lengths of the yachts in the marinas' 'doesn't show Clwyd Marina's results' 'not specified' 'not specific' 'range not given for the Clwyd Marina (so can't identify the longest yacht)' Do not accept, e.g. 'don't know how many yachts in the marinas' 'not mentioned for either marina'

8(a) $\sqrt{\frac{25}{\pi}}$ or $\frac{5}{\sqrt{\pi}}$ or $\frac{\sqrt{25}}{\sqrt{\pi}}$ or equivalent	B2	ISW Accept $\sqrt{(25 \div \pi)}$ or $5 \div \sqrt{\pi}$ or $\sqrt{25} \div \sqrt{\pi}$ For B1 accept π given as 3.1(4...) B1 for sight of any of the following: • $\pi \times \text{radius}^2 = 25$ • $r^2 = 25 / \pi$ • $\pi r^2 = 25$ • $\sqrt{25} / \pi$ • $\sqrt{25} \div \pi$ • $5/\pi$
8(b)(i) $500 \times 60 \div 4$ or equivalent 7500 (cm ³ per minute)	M1 A1	May be seen in stages Answer given within the statement takes precedence
8(b)(ii) $500 \div (2 \times 25)$ or equivalent 10 (cm)	M1 A1	May be seen in stages