GCSE MARKING SCHEME

AUTUMN 2020

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

INTRODUCTION

This marking scheme was used by WJEC for the 2020 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 2020 MARK SCHEME

GCSE *Mathematics Numeracy* **Unit 1: *Intermediate* Tier**	Mark	Comments
1. (Cost of strawberries) 20 – 6.8(0) − 1.5 × 4 (£) 7.2(0)	M2 A1	M1 for (Blueberries cost) 1.5 × 4 (=6) Award M2, A1 for appropriate sight of (£)7.2(0) irrespective of any further inappropriate working
(Mass of strawberries) (20 – 6.8(0) − 1.5 × 4) ÷ 3.6 or 7.2(0) ÷ 3.6	M1	In FT allow sight of 14.2(0) as indication of 20 – 6.8(0) attempted Allow convincing appropriate repeated addition FT provided there has been an attempt at a subtraction of the cost of blueberries from 20 – 6.8(0) (=13.2(0)), 20 or 6.8(0) and provided M1 previously awarded, e.g. • (20 – 1.5 × 4) ÷ 3.6 • (6.8(0) – 1.5 × 4) ÷ 3.6 OR FT (20 – 6.8(0) – 'their cost of blueberries') ÷ 3.6 provided 'their cost of blueberries' > (£)4
2 (kg)	A1	CAO. Must be from correct working If no marks, award SC1 for an answer of 3.6(6kg) or 3.67(kg) or 3.7(kg) (from (20 – 6.80) ÷ 3.6) An answer only of 2 kg is awarded all 5 marks (strictly provided no incorrect working seen - this is answer only). Any other answer only, such as '2 bags', is awarded no marks.

2(a) (Total of first year cost is purchase + insurance + food) 450 + 12 × 18 + 7 × 52 (450 + 216 + 364) (£) 1030	M2 A2	Allow food cost of 365 or 366 (from £1 per day) M1 for any one of: • a sum of 2 or 3 of amounts including any two of 450, 12 × 18 and 7 × 52 • 12 × 18 + 7 × n, where n = 48 to 51 inclusive • 450 + 7 × n, where n = 48 to 51 inclusive • sight of 216 **and** 364 or 365 or 366 Use of 365 days leads to (450 + 216 + 365 = £)1031 Use of 366 days leads to (450 + 216 + 366 = £)1032 A1 for sight of 450 + 216 + 364 or sum using 365 or 366 days FT from M1 for possible A2 (summing all 3 costs) with use of food costs for 48 to 51 weeks inclusive: • 48 weeks leads to (450 + 216 + 336 = £)1002 • 49 weeks leads to (450 + 216 + 343 = £)1009 • 50 weeks leads to (450 + 216 + 350 = £)1016 • 51 weeks leads to (450 + 216 + 357 = £)1023 or A1 for sight of the sum of 3 appropriate amounts (as given above), with products correctly evaluated OR FT from M2 or M1 for A1 for their final answer from a correctly evaluated sum in which at least 2 of the 3 amounts are correct. *Strict FT for adding their 3 amounts correctly or if they only have 2 amounts, adding their 2 amounts correctly*
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.

2(b)(i) 25 ÷ 2.5 or 30 ÷ 2.5 OR for sight of 2.5 × 10 or 2.5 × 12 10 (inches) 12 (inches)	M1 A1 A1	Allow for sight of repeated addition, 10 or 12 lots of 2.5 to be added Either of the correct responses implies M1 If M1, A0, A0 also award SC1 if 'their 12' - 'their 10' = 2 Answer line takes precedence. An answer needs to be selected for A marks to be awarded, however if M1, A0, A0 awarded, also award SC1 for sight of 2.5 × 10 = 25 **and** 2.5 × 12 = 30
2(b)(ii) 6 × 2.2 or 8 × 2.2 13.2 (pounds) 17.6 (pounds)	M1 A1 A1	Either of the correct responses implies M1 If M1, A0, A0 also award SC1 if 'their 17.6' - 'their 13.2' = 4.4 Answer line takes precedence.

3(a)(i) 070(°) ± 3(°)	B1	
3(a)(ii) Corwen	B2	B1 for Llangollen or Llanrhaeadr or Llanfyllin
3(b) 3·5 cm represents 3·5 × 20 000 ÷ 100 m or 3·5 : 3·5 × 20 000 ÷ 100 or 3·5 × 200 700 (m)	M2 A1	Award M1 for any of the following: • 1 cm represents 200 m • 3·5 × 20 000 or 70 000 • 3·5 × 'their 20 000' where 'their 20 000' is from a place value error in conversion • a number with significant digit 7, any other digits are all zeros CAO
4. (x =) 110(°) (y =) 115(°) (z =) 73(°)	 B1 B1 B1	Mark answer space if completed, otherwise check diagram FT 'their 115(°)' – 42(°) correctly evaluated, i.e. check 'their y' - 'their z' = 42
5(a) 1	B1	
5(b) 2	B1	
5(c) Unambiguously stating or implying 'No' with working, e.g. shows any of: • 34 + 8 = 42 people with 1 or 2 attempts • the median is the 43rd person	E1	Allow for sight of 42 or 42.5 or 43 with indication of 'No'
6(a) (Cost of flags 4 × 40 =) 160(p) (Cost of muffin cases) (12 × 4 ÷ 16) × 22 or 3 × 22 (=) 66 (p) (Cost of ingredients) (12 × 4 ÷ 6) × 25 or 8 × 25 (=) 200 (p) (Money taken in selling 12 × 4 × 30 =) 1440(p) (Profit) 1440 – 160 – 66 – 200 (= 1440 – 4.26) 1014(p) or (£)10.14	 B1 M1 A1 M1 A1 B1 M1 A1	Shown in pence, accept in £. However, if units are incorrect penalise – 1 once only, unless corrected in further work *Mark final answers at each stage (then possible FT)* Accept use of 'their derived number of flags' as 'their 48 (4×12) flags' FT their consistent number of flags for all marks, then penalise -1 if 'their derived number of flags' ≠ 48 If previous M0, M0 award SC1 here for sight of any one of the following: • (number of packs of muffin cases) 12×4÷16 **and** (number of multiples of ingredients) 12×4÷6 • (number of packs of muffin cases =) 3 • (number of multiples of ingredients =) 8 FT the following: • 'their 160', provided from an attempt at 4×40, • 'their 1440', provided from an attempt at 12×4×30, • 'their 66' and 'their 200' provided at least 1 M1 mark has previously been awarded If units are given they must be correct

6(b) $\frac{400 - 80}{80}$ (× 100) or equivalent 400 (%)	M1 A1	
6(c) 78p	B1	
7(a)(i) Can't tell	B1	
7(a)(ii) Unambiguously stating or implying 'No' with a reason, e.g. 'shows negative correlation (this week)', 'likely to be similar to this week', 'more rain, less sunshine'	E1	Allow 'No' with, e.g. 'can't tell from this week', 'can't predict the weather (from last week)', 'can't know this' Do not accept, e.g. 'you can't have a positive correlation (both can't increase)'
7(b)(i) Unambiguously stating or implying 'No' with a reason, e.g. 'all scattered' 'no relationship',	E1	If a satisfactory reason is given ignore any further spurious comments Allow, e.g. 'no pattern', 'no trend', 'no steady plotted points', 'you can't draw a line of best fit', 'no steady line', 'they are not in a line', 'random points', 'points all over the place', 'plots are everywhere', 'no link' Do not accept, e.g. 'no correlation' 'there were lots of birds in the garden when the wind speed was low and high', 'too many outliers', 'spread far apart'
7(b)(ii) 7 (birds)	B1	
7(b)(iii) Day: Wednesday; Wind speed (m.p.h.): **1.5** Day: Friday; Wind speed (m.p.h.): **6(.0)**	B1 B1	If no marks, award B1 if the results are reversed If no marks, award SC1 for answers of (Wednesday) 1.4 and (Friday) 5.6

8(a) 66.36 ÷ 6 × 11 or 66.36 ÷ 6 × (1 + 4 + 6) or 66.36 ÷ 6 + 4 × 66.36 ÷ 6 + 66.36 (= 11.06 + 44.24 + 66.36) or equivalent	M2	M1 for sight of 66.36 ÷ 6 or 11.06, or for sight of '11.6(0)' (*Note if ×10 seen, check if there is indication if this was derived from 1 + 4 + 6, if so accept for possible M2, if no evidence M0)*
(£) 121.66	A1	CAO If no marks, award SC1 for an answer of (£)182.49 (from 11 × 66.36 ÷ 4)
8(b) (First year increased charge) 24 × 0.05 + 24 or 24 + 24 ÷ 10 ÷ 2 or equivalent	M1	
(£) 25.2(0)	A1	Accept 2520(p). Ignore units given
(Second year increased charge) 25.2(0) × 0.05 + 25.2(0) or 25.2(0) + 25.2(0) ÷ 10 ÷ 2 or equivalent	M1	FT 'their 25.2(0)'
(Increased charge after 2 years is) (£) 26.46	A1	Accept 2646(p). If units are given they must be correct An answer of (£)26.4(0) (from 24 + 2 × 1.20) implies M1, A1, m0, A0 Sight of 24 × 1.05^2 implies M2, also award A1 for 24 × 1.1025
8(c) ½ ×(2.2 + 1.8) × height trapezium + 2.2 × 2 = 6.8	M2	M1 only if brackets omitted for sum of parallel sides in the overall calculation unless dealt with correctly in further working, OR M1 for ½ ×(2.2 + 1.8) × height trapezium (brackets must be given or any 'missing brackets' implied by correct interpretation)
2 × height trapezium = 2.4 or height trapezium = 1.2	A1	
(Overall length =) 3.2 (m)	A1	FT 'their 1.2' + 2 provided at least M1 previously awarded If no marks, award SC1 for area of the trapezium as 2.4 (m^2) provided not from incorrect working, e.g. 6.8 – (2.2 + 1.8 + (0).2 + (0).2) = 2.4 is SC0 6.8 – 2.2 × 2 = 2.4 is SC1
8(c) Alternative method 1: *(2+ht trap)×2.2 – 2×½×[(2.2 – 1.8) ÷ 2] ×ht trap = 6.8*	*M2*	*M1 for ½×[(2.2 – 1.8) ÷ 2] ×height trapezium or* *2×½×[(2.2 – 1.8) ÷ 2] × height trapezium*
Height of trapezium = 1.2	*A1*	
(Overall length =) 3.2 (m)	*A1*	*FT 'their 1.2' + 2 provided at least M1 previously awarded*
8(c) Alternative method 2: *2×½×(2+overall length)× [(2.2 – 1.8) ÷ 2]* *+ overall length×1.8 =6.8*	*M2*	*M1 for ½×(2+overall length)× [(2.2 – 1.8) ÷ 2] or* *2×½×(2+overall length)× [(2.2 – 1.8) ÷ 2]*
(Overall length =) 3.2 (m)	*A2*	*A1 for 2 × Overall length = 6.4 or correct simplified equation in terms of overall length*
9.Unambiguous vertical line 5 cm ± 2 mm from fence	B1	
Angle bisector between house and fence ± 2°	B1	Accept a horizontal line drawn from the fence, 5cm (± 2 mm) away from the house
Correct intersection, position of the tree	B1	FT from B1 for intersection of two straight lines provided both lines within tolerance ± 4 mm or ± 4° Award B3 if the correct position is indicated provided not from incorrect working

10(a) (600 ÷ 8 =) 75 1st 2nd 3rd 4th 5th 6th 7th 8th 25 100 175 250 325 400 475 550	B1 B1	May be seen amongst other inappropriate working, but not from 75 written in the table FT 'their 600 ÷ 8' incorrectly evaluated
10(b) States it is a random selection (from the first 75 pupils)	E1	Ignore any additional spurious statements Allow for statement that implies 'random' selection, e.g. 'sticks a pin in (a printout of) the spreadsheet', 'the headteacher picked a random number', 'everyone had a fair chance of selection' Do not accept, e.g. 'selects a random odd number' 'using a systematic sampling method' without further clarification,
11(a) (280 – 100 + 500) ÷ 50 or (280 – 100) ÷ 50 + 500 ÷ 50 (Sell each ticket for) (£) 13.6(0)	M2 A1	M1 for sight of any one of the following: • (280 + 500) ÷ 50 (= £15.60) • (280 – 100) ÷ 50 (= £3.60) • (– 100 + 500) ÷ 50 (= £8) If units are given they must be correct FT from M1 awarded If no marks, award SC1 for either of the following: • an answer of (£)680 (from 280 – 100 + 500) • sight of 500 ÷ 50 correctly evaluated as (£)10, allow if embedded within other calculation
11(a) Alternative method: *(1000 – 100) ÷ 250 + 500 ÷ 50* *or equivalent using any two points on the line, e.g.* *(460 -100) ÷ 100 + 500 ÷ 50* *(640 -100) ÷ 150 + 500 ÷ 50* *(£) 13.6(0)*	*M2* *A1*	*M1 for sight of any one of the following, or equivalent:* • *(1000 – 100) ÷ 250 (= £3.60)* • *(460 -100) ÷ 100 (= £3.60)* • *(640 -100) ÷ 150 (= £3.60)* • *'an overall cost' - 100* *'number of people for that overall cost'* • *1000 ÷ 250 + 500 ÷ 50 (= £14)* • *460 ÷ 100 + 500 ÷ 50 (= £14.60)* • *640 ÷ 150 + 500 ÷ 50 (= £ 14.26 or £14.27)* • *'an overall cost'* + *500* *'number of people for that overall cost'* *50* *If units are given they must be correct* *FT from M1 awarded with answer rounded or truncated to a penny* *If no marks, award SC1 for sight of 500 ÷ 50 correctly evaluated as (£)10, allow if embedded within other calculation*

11(b) Considering a factor of 400 (200, 100 or 50) people or other suitable point, excluding £500 for charity, e.g. • $\frac{\text{'an overall cost'} - 100}{\text{'number of people for that overall cost'}}$ • (200 people) (820 – 100) ÷ 200, • (100 people) (460 – 100) ÷ 100, • (50 people) (280 – 100) ÷ 50 (Charity contribution) 500 ÷ 400 (Total) (£) 4.85	M1 M1 A1	FT 'their $\frac{\text{'an overall cost'} - 100}{\text{'number of people for that overall cost'}}$' i.e. 'their 3.60' (= £3.60) (= £ 1.25) May be embedded within stages of calculation If units are given they must be correct If M0, M1, A0 also award SC1 for correct evaluation resulting from the omission of deducting £100, e.g. • (820 ÷ 200 + 1.25 = £) 5.35 • (460 ÷ 100 + 1.25 = £) 5.85 • (280 ÷ 50 + 1.25 = £) 6.85 • correctly evaluated $\frac{\text{'an overall cost'}}{\text{'number of people for that overall cost'}}$ + 1.25
11(b) Alternative method: *Considering total cost for 400 people, e.g.* *(400 ÷ 50) × (280–100) + 500 or 8 × 180 + 500* *or 1440 + 500* *or (400 ÷ 100) × (460–100) + 500 or 4 × 360 + 500* *or (400 ÷ 200) × (820–100) + 500 or 2 × 720 + 500* *or equivalent* *÷ 400* *(£) 4.85*	*M1* *m1* *A1*	*If units are given they must be correct* *If no marks (due to omission of £100), award* *SC1 for (8 × 280 + 500) ÷ 400* *or SC2 for answer (£)6.85* *or SC1 for (4 × 460 + 500) ÷ 400* *or SC2 for answer (£)5.85* *or SC1 for (2 × 820 + 500) ÷ 400* *or SC2 for answer (£)5.35*
12(a) 1×10^6 (mm^2)	B2	Allow 10^6 (mm^2) B1 for any one of the following • a calculated area 1 000 000 (mm^2), 1000^2, $(10^3)^2$ or equivalent • 'their clearly written number' written correctly in standard form
12(b) 2700 ÷ (0.)9(0) or equivalent ÷ (0.)75 or equivalent 4000 (cm^2)	 M1 M1 A2	M marks can be awarded in either order Sight of 2700 ÷ (0.9 × 0.75) is awarded M2 A1 for 2700 ÷ 0.9 = 3000 or 2700 ÷ 0.75 = 3600 or for 2700 ÷ 0.675 or for an appropriate FT division correctly evaluated *(Note: sight of 2700 ÷ 0.675 is awarded M2 A1)*

13.		<u>In all alternative methods for answering this question accept alternative working in cm, if place value error in conversion of units penalise -1 once only</u>
(Area of cross-section) $6 \times ½ \times 30 \times (52 \div 2)$	M3	M2 for $½ \times 30 \times (52 \div 2)$ (= 390) M1 for any **use of** $52 \div 2$ (= 26) (May be embedded)
$2340\ (mm^2)$	A1	
(Volume of the box) $234000\ (mm^3)$ OR for a comparison $2340\ (mm^2) > 2300\ (mm^2)$	A1	FT 'their 2340' × 100 correctly evaluated provided at least M2 previously awarded
13. Alternative method (trapezia) *(Area of cross-section) $2 \times ½ \times (52 \div 2) \times (30 + 2 \times 30)$*	*M3*	*M2 for $½ \times (52 \div 2) \times (30 + 2 \times 30)$ (= 1170)* *M1 for use of $52 \div 2$ (= 26)*
$2340\ (mm^2)$	*A1*	
(Volume of the box) $234000\ (mm^3)$ *OR* *for a comparison $2340\ (mm^2) > 2300\ (mm^2)$*	*A1*	*FT 'their 2340' × 100 correctly evaluated provided at least M2 previously awarded*
13. Alternative method (½absinC) *(Area of cross-section) $6 \times ½ \times 30 \times 30 \times \frac{\sqrt{3}}{2}$*	*M3*	*M2 for $½ \times 30 \times 30 \times \frac{\sqrt{3}}{2}$* *M1 for (6 ×) $½ \times 30 \times 30 \times \sin 60°$*
$1350\sqrt{3}$ or $2338(.2\ mm^2)$ or $2340\ (mm^2)$	*A1*	
(Volume of box) $233820\ mm^3$ or $234000\ (mm^3)$ *OR* *for a comparison $2338(.2\ mm^2) > 2300\ (mm^2)$*	*A1*	*FT 'their 2340' × 100 correctly evaluated provided at least M2 previously awarded*
13. Alternative method (triangle area) *(Area of triangle) $½ \times 30 \times (52 \div 2)$*	*M2*	*(= 390)*
(Minimum area of triangle required) $2300 \div 6$	*M1*	
$383(.33...)$	*A1*	
Comparison $390 > 383(.33...)$	*A1*	