GCSE MARKING SCHEME

AUTUMN 2019

GCSE
MATHEMATICS – NUMERACY
UNIT 2 - INTERMEDIATE TIER
3310U40-1

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INTRODUCTION

This marking scheme was used by WJEC for the 2019 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.

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GCSE Mathematics – Numeracy Unit 2: Intermediate Tier	Mark	Comments
1. 0.64 × 125 or (100 ×) 78/125	M1	Accept equivalent complete non calculator methods Allow 64% × 125 but do not accept 64% of 125 for M1 (unless 80 marks seen, in which case M1 A1)
80 (marks) or 62(.4%)	A1	Accept sight of 0.62(4) Accept sight of 80/125 for M1, A1
Conclusion e.g. 'Paulo (as 64% > 62.4%)', 'Paulo (as 80 > 78), 'Paulo (sight of $\frac{78}{125}$ and $\frac{80}{125}$)	A1	FT depends on M1 previously awarded If working with both Ceri and Paulo, with one correct and one incorrect, mark the correct method, i.e. possible M1, A1, but must be final A0 whatever conclusion is given
2(a) 4, 6 and 16 in this order	B2	Answers in the table take precedence B1 for any 2 correct entries
2(b) 38 bottles	B1	
2(c) 30 × 2 ÷ 12 or 30 × 1.5 ÷ 9 or 30 ÷ 6 or equivalent	M1	
5	A1	Accept an embedded 5 for M1 A1, provided it is not contradicted by their choice of final answer, in which case award M1 A0, e.g. 12 × 5 = 60 salmanazars M1 A0 9 × 5 = 45, 9 salmanazars, M1 A0 9 × 5 = 45, M1 A1 12 × 5 = 60, M1 A1
3. ....., ..., 17, 18, 18 as the three eldest 10, 12, ..., ..., ..., as the two youngest	B1 B1	Must be eldest but not necessarily in order Must be youngest but not necessarily in order FT 'their 18 (eldest)' – 8 and their 18 (eldest)' – 6 respectively If B0, B0 award SC1 here for sight of 18, 18 provided not other repeat ages
(Mean) (10+12+17+18+18) ÷ 5 or 75 ÷ 5 (-2)	M1	FT 'their 10 + 12 + 17 + 18 + 18' ÷ 5, provided it is a **sum of 5 values** divided by 5
(Coleen is) 13 (years old)	A1	FT 'their 75 ÷ 5' – 2 correctly evaluated, accepting rounded or truncated age

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4(a)(i) 33 × 6/11 or 6 × 33 ÷ 11 18 (friends)	M1 A1	ISW Allow: • 18 friends 12 dogs for M1 A1 • sight of 18/33 for M1 A0 • 18 12 for SC1
4(a)(ii) $\frac{2}{3} \times \frac{6}{11}$ or $\frac{2}{3} \times \frac{18}{(33)}$ $\frac{36}{99}$ or $\frac{12}{33}$ or $\frac{4}{11}$	M1 A1	FT 'their 18' 2/3 × 18 leading to an answer of 12 or a final answer of 12 implies M1 ISW If no marks, award SC1 for sight of 12/18
4(b) 21 : 13 : 6	B1	Mark final answer Allow 21 dogs : 13 cats : 6 fish Do not accept 21 dogs 13 cats 6 fish
5(a) 1 : 1 000 000	B1	
5(b) (Average speed in km/h =) $\frac{22}{25/60}$ or $\frac{22}{25} \times 60$ or $\frac{22}{25 \div 60}$ 52.7 (km/h) to 53 (km/h)	M2 A1	Allow M2 for sight of correct method, including premature approximation (e.g. using 25/60 = 0.4(166...) M1 for any one of: • sight of 22 /(0.)25 • sight of 22 ÷ (0.)25 • for answer of 0.88 (km/min) • for answer of 88 Treat use of 2.2 instead of 22 as MR-1 on accuracy mark only

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<table>
<tr>
<td>6(a) Descriptions of no correlation, e.g.
‘no relationship’,
‘no correlation’,
'none',
‘no connection’</td>
<td>B1</td>
<td>Allow, e.g.
‘no’

Do not accept, e.g.
'(all) scattered (about)'<br>'random',
‘neutral’,
‘no pattern’,
‘varied correlation’,
‘mixed correlation’

Allow if a correct response is given with one of the phrases listed above.
Do not allow a correct response with an incorrect response, e.g. ‘none but slightly positive’</td>
</tr>
<tr>
<td>6(b)
<table>
<tr><th>Name</th><th>Height (cm)</th><th>Number</th></tr>
<tr><td>Gwenda</td><td>145</td><td>88</td></tr>
<tr><td>Daniel</td><td>166</td><td>88</td></tr>
<tr><td>Lotte</td><td>130</td><td>90</td></tr>
<tr><td>Iona</td><td>171</td><td>66</td></tr>
<tr><td>Steffan</td><td>171</td><td>24</td></tr>
</table>
</td>
<td>B4</td>
<td>All entries correct

B3 for any 8 or 9 entries correct

B2 for any 5, 6 or 7 entries correct

B1 for any 3 or 4 entries correct

Penalise -1 only if entries are consistently reversed in the table</td>
</tr>
</table>

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7(a) (Buy 1 get 1 free, cost of 3 pizzas) (£)17.6(0)	B1	
(35% off 3 pizzas) 3 × 8.8(0) - 0.35 × 3 × 8.8(0) or 0.65 × 3 × 8.8(0)	M3	M2 for sight of • 0.35 × 3 × 8.8(0) (= £9.24) or equivalent • 0.65 × 8.8(0) (= £5.72) or equivalent M1 for any of • 3 × 8.8(0) (= £26.40) • 0.35 × 8.8(0) (= £3.08) or equivalent • FT for 3 × 'cost their reduced priced pizza' correctly evaluated provided 'cost their reduced priced pizza' < £8.80
(£)17.16 and selecting '35% off'	A1	CAO for (£)17.16 with a conclusion, but FT conclusion from 'their £17.60' with (£)17.16 comparison
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.
7(b) Explanation, e.g. '(even number of pizzas gives) 50% off (which is better than 35%)', '50% off (is better than 35% off)', 'with an even number of pizzas he will get half of them free (which is more than 35% free)'	E1	Accept explanation based on a different even number pizzas, including buying 20 getting 10 free Allow, e.g. 'he would (only) pay for 5 pizzas (not 10)', 'half of the pizzas are free' 'he would (only) pay for half the pizzas', 'get 5 pizzas free', 'the more pizzas you get, the better this option is' '2 is an even number and goes into 10 exactly' **Do not ignore** contradictions

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8(a)(i) ($)1.80 and ($) 1.80	B2	Ignore units stated in £, p in error Accept giving the names of the stamps B1 for stamps from those available with sum $3.60, but using **3** stamps, i.e. • ($)1.60, ($)1.60 and 40(c) • ($)2.80, 40(c) and 40(c) Do not accept with 4 stamps or more
8(a)(ii) ($)2.80, ($)2.80 and ($)1.80 or ($)2.30, ($)2.30 and ($)2.80 in any order	B2	Ignore units stated in £, p in error Accept giving the names of the stamps, e.g. 2 Church of Good Shepherd and 1 Mount Taranaki B1 for stamps from those available with sum $7.40, but using (**4 or) 5** stamps, i.e. • ($)2.80, ($)2.30, ($)1.80, 40(c), 10(c) • ($)2.80, ($)2.30, ($)1.60, 40(c), 30(c) • 2 × ($)2.80, ($)1.60, 2 × 10(c) • 3 × ($)2.30, 40(c), 10(c) • 3 × ($)1.80, ($)1.60, 40(c) • ($)2.30, 3 × ($)1.60, 30(c) • ($)2.30, ($)1.80, 2 × ($)1.60, 10(c) Do not accept with 6 stamps or more, e.g. 4 × ($)1.80 and 2 × 10(c)
8(b) (Change to £) 550 × 0.53 (£)291.5(0) (Only £10 and £20 notes available so he can buy) (£)290 (Fewest number of notes making up £290,) 14 £20 (notes) and 1 £10 (notes) (Cost in $ to buy £290 is) 290 ÷ 0.53 or 550 – 1.5(0) ÷ 0.53 (= 550 – 2.83...) ($)547.17	M1 A1 A1 A1 M1 A1	 FT 'their (£)291.5(0)' (provided not a multiple of 10) rounded down to nearest multiple of 10 Accept stated or implied as (£)1.50 can't be converted Sight of (£)290 with no incorrect working implies previous A1 FT 'their £290' provided it is a multiple of 10 Must be fewest number of notes Sight of correct notes with no incorrect working implies previous A1 FT 'their whole number multiple of £10' ÷ 0.53 Ignore attempt at any further calculation if 290 ÷ 0.53 seen Must be <($)550 **and** depends on M1 M1 previously awarded Must be to the nearest cent Mark final answer If final M0 A0, then award SC1 for ($)2.83 (left) or similar FT

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9(a) in any orientation	B1	Allow: • intention of straight lines and right angles • two equal rectangles joined Do not accept if end elevation also drawn, unless plan view is labelled
9(b)(i) (Concrete costs) 66 × 39(p) or equivalent (Builder charges) 27 + ⅓ × 27 or equivalent (Total cost of making the step) (£) 61.74	M1 M1 A1	(=£25.74) Allow M1 for sight of a multiplication involving the **digits 66...** with 39(p) or equivalent (= £36) Allow methods breaking down the hour to find the cost for 20 minutes provided sufficient evidence seen Do not allow: • 27 + 0.3 × 27 = 27 + 8.10 = £35.10 • 27 + ⅓ × 27 = 27 + 8.10 = £35.10 Allow 27 + 0.33 × 27 = £35.91 or better CAO
9(b)(ii) (Area cross-section) as sum of two products: 50 × (20+25) – 24×25 (= 2250 – 600) or (20+25) × (50–24) + 20×24 (= 1170 + 480) or 50×20 + 25×(50–24) (= 1000 + 650) OR (Area cross-section) as sum of three products: 24×20 + 26×20 + 26×25 (= 480 + 520 + 650) (Area cross-section) 1650 (cm^2) (Length = Volume ÷ area cross-section) 66 000 ÷ 1650 40 (cm)	 M2 A1 M1 A1	Check diagram for working Accept a similar method given by an equation or expressions M1 for sight of either: • difference or sum of 2 products, with 1 correct • sum of 3 products with 2 correct • all products correct but no attempt to sum CAO FT 66000 ÷ 'their 1650' provided 'their 1650' is dimensionally correct ISW FT 66000 ÷ 'their 1650' only allowing rounding or truncation of decimals

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10(a)(i) 11 to 15	B1	
10(a)(ii) Midpoints 3, 8, 13, 18 3×3 + 8×7 + 13×12 + 18×18 (9 + 56 + 156 + 324 = 545) ÷ 40 13.6(25 mugs)	B1 M1 m1 A1	 FT 'their midpoints' provided at least 3 of 'their 4 midpoints' lie within the appropriate group, including lower and upper bounds Use of lower bound gives 465 Use of upper bounds gives 625 Allow 13 or 14 (mugs) from correct working Use of lower bounds gives 11.625 (allow 11 or 12) use of upper bounds gives 15.625 (allow 15 or 16)
10(b) (Volume) $\pi \times 4.3^2 \times (11.8 - 2)$ or equivalent Answer in the range 568 (cm^3) to 569.4 (cm^3)	M2 A1	Accept methods shown in stages Allow M1 for sight of $\pi \times 4.3^2 \times 11.8$ or $\pi \times 4.3^2 \times 2$, including if embedded or included with incorrect working. CAO. Accept $\frac{90601\pi}{500}$ or 181.2(02..)π Provided M1 previously awarded then also award SC1 for an answer in the range • 684.8 to 686 (cm^3) (for the volume of the mug ignoring the 2 cm) or • 682.8 to 684 (cm^3) (for the volume of the mug subtract 2 cm) but **do not ignore** further working in either case

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11(a)(i) (Circumference of a wheel) π × 6.4 or π × 0.064 (Number of revolutions is) 2340 × 100 ÷ (π × 6.4) or 2340 ÷ (π × 0.064) or equivalent (Number of revolutions is) Answer in the range 11636(.69...) to 11644(.1083)	M1 M2 A1	Ignore inclusion of '×4' (for 4 wheels) for M1 M2 (A0) FT 'their circumference' provided 'their calculation of circumference' includes π in the calculation (with consistent place value for M2, with inconsistent place value for M1) M1 for appropriate calculation but containing a place value error, e.g. 2340 ÷ (π × 6.4) or 234000 ÷ (π × 0.064) or 2340 ÷ (π × 0.64) CAO, except allow an answer of 11700 (from premature approximation of circumference to 20cm) Mark final answer (Do not ignore further work such as ÷ 4)
11(a)(ii) Assumption, e.g. 'rode all the way', 'didn't carry the skateboard', 'was able to use his skateboard' 'skated in a straight line', 'each wheel rotates the same number of times' 'wheels perfectly circular', 'no wear on the wheels', 'the wheels are all on the ground throughout'	E1	Allow, e.g 'went directly to Sab's house' Do not accept, e.g. '2340m is not exact', 'he doesn't stop on his journey', 'constant speed'
11(b) (Mass of Finbar's skateboard deck) 2.6 × 1800 × 1.2 AND (Mass of Sab's skateboard deck) 0.7 × 1600 × 1.4 (Mass of Finbar's skateboard deck) 5616 (g) **AND** (Mass of Sab's skateboard deck) 1568 (g) (Difference is) 4048 (g)	M3 A1 A1	Accept shown in stages but not if embedded within incorrect working M2 for one of the following provided **not embedded** within incorrect working, may be shown in stages: (Mass of Finbar's skateboard deck) 2.6 × 1800 × 1.2 OR (Mass of Sab's skateboard deck) 0.7 × 1600 × 1.4 M1 for any one of the following, including embedded within incorrect working, may be shown in stages: • (Finbar's deck volume) 1800 × 1.2 (= 2160) • (Sab's deck volume) 1600 × 1.4 (= 2240) • (g per cm) 2.6 × 1800 (= 4680) • (g per cm) 0.7 × 1600 (= 1120) CAO Answer must be in grams FT 'their 5616' – 'their 1568' provided M2 previously awarded

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12(a)(i) Height of the gate 110 (cm) or 1.1(0 m)	B1	Allow other estimates of height of the gate (100 cm to 110 cm inclusive) If units are given they must be correct If incorrect conversion of units seen later, B0 and FT for possible M1 A1 A1
(Diagonal^2 =) $2^2 + 1.1^2$ or $200^2 + 110^2$	M1	FT 'their derived 110 or 1.1(0)' provided units are consistent in the application of Pythagoras' Theorem Allow use of 190 cm to 200 cm for the width of the gate in calculating the diagonal length
Diagonal^2 = 5.21 or (Diagonal =) $\sqrt{5.21}$ or Diagonal^2 = 52100 or (Diagonal =) $\sqrt{52100}$ or 228.(...cm)	A1	
(Diagonal =) 2.28(...m) or 2.3(m)	A1	Answer must be in metres Allow truncation to 2.2(m) Do not accept truncation to 2(m) FT from M1 for the correctly evaluated square root of 'their 5.21' provided 'their answer' > 2 (m) for possible A1
12(a)(ii) Assumption, e.g. 'diagonal plank went to each end', 'thought of the planks as lines', 'that it is a right angle (triangle)', 'it goes from corner to corner'	E1	Allow, e.g. 'no thickness' (allow as implying width) 'width (or length) of gate is not exact' (could mean diagonal plank not quite touching across full width of the gate) Do not accept, e.g. 'all planks have the same thickness' (as not an assumption whether meaning width or not), 'the gaps are not exact' (as question defines the gaps) 'lengths are not exact', 'that this diagonal plank is longer than the others', 'it's straight' **Ignore** additional spurious comments

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12(b) (Cost of 1 horizontal plank is) (£) 3 × 8.55 ÷ 5 OR (Cost of 1 diagonal plank is) (£) 4 × 8.55 ÷ 5	M1	Accept for sight of (£)5.13 Accept for sight of (£)6.84
(Total cost of gate is) 2 × 8.55 + 5 × 3 × 8.55 ÷ 5 + 4 × 8.55 ÷ 5 or 2 × 8.55 + 5 × 5.13 + 6.84 17.10 + 25.65 + 6.84	m2	m1 for 2 out of the 3 terms correct
(=) (£) 49.59	A1	CAO If no marks, award SC1 for sight of (8.55 ÷ 5 = £)1.71 or ((3+4+5) × 8.55 ÷ 5 = £)20.52
Alternative method *(2 × 5 + 5 × 3 + 4)* *× 8.55* *÷ 5* *(£) 49.59*	*M1* *m1* *m1* *A1*	 *m1 in either order* *CAO*

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