



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 <i>Mathematics Numeracy</i> Unit 1: <i>Intermediate Tier</i> | Mark | Comments |
|---|--------------------------------------|---|
| <p>1. (Cost of strawberries) $20 - 6.8(0) - 1.5 \times 4$ $(\pounds) 7.2(0)$</p> <p>(Mass of strawberries) $(20 - 6.8(0) - 1.5 \times 4) \div 3.6$ or $7.2(0) \div 3.6$</p> <p align="right">2 (kg)</p> | <p>M2 A1</p> <p>M1</p> <p>A1</p> | <p>M1 for (Blueberries cost) $1.5 \times 4 (=6)$ Award M2, A1 for appropriate sight of $(\pounds)7.2(0)$ irrespective of any further inappropriate working</p> <p>In FT allow sight of $14.2(0)$ as indication of $20 - 6.8(0)$ attempted Allow convincing appropriate repeated addition</p> <p>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.</p> <ul style="list-style-type: none"> • $(20 - 1.5 \times 4) \div 3.6$ • $(6.8(0) - 1.5 \times 4) \div 3.6$ <p>OR</p> <p>FT $(20 - 6.8(0) - \text{'their cost of blueberries'}) \div 3.6$ provided 'their cost of blueberries' > $(\pounds)4$</p> <p>CAO. Must be from correct working</p> <p>If no marks, award SC1 for an answer of 3.6(6kg) or 3.67(kg) or 3.7(kg) (from $(20 - 6.80) \div 3.6$)</p> <p>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.</p> |

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| <p>2(a) (Total of first year cost is purchase + insurance + food) $450 + 12 \times 18 + 7 \times 52$ $(450 + 216 + 364)$</p> <p style="text-align: right;">(£) 1030</p> | <p>M2</p> <p>A2</p> | <p>Allow food cost of 365 or 366 (from £1 per day)</p> <p>M1 for any one of:</p> <ul style="list-style-type: none"> • a sum of 2 or 3 of amounts including any two of 450, 12×18 and 7×52 • $12 \times 18 + 7 \times n$, where $n = 48$ to 51 inclusive • $450 + 7 \times n$, where $n = 48$ to 51 inclusive • sight of 216 and 364 or 365 or 366 <p>Use of 365 days leads to $(450 + 216 + 365 = \text{£})1031$ Use of 366 days leads to $(450 + 216 + 366 = \text{£})1032$</p> <p>A1 for sight of $450 + 216 + 364$ or sum using 365 or 366 days</p> <p>FT from M1 for possible A2 (summing all 3 costs) with use of food costs for 48 to 51 weeks inclusive:</p> <ul style="list-style-type: none"> • 48 weeks leads to $(450 + 216 + 336 = \text{£})1002$ • 49 weeks leads to $(450 + 216 + 343 = \text{£})1009$ • 50 weeks leads to $(450 + 216 + 350 = \text{£})1016$ • 51 weeks leads to $(450 + 216 + 357 = \text{£})1023$ <p>or</p> <p>A1 for sight of the sum of 3 appropriate amounts (as given above), with products correctly evaluated</p> <p>OR</p> <p>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. <i>Strict FT for adding their 3 amounts correctly or if they only have 2 amounts, adding their 2 amounts correctly</i></p> |
| <p>Organisation and communication</p> <p>Writing</p> | <p>OC1</p> <p>W1</p> | <p>For OC1, candidates will be expected to:</p> <ul style="list-style-type: none"> • 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 <p>For W1, candidates will be expected to:</p> <ul style="list-style-type: none"> • 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. |

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| 3(a)(i) $070(^{\circ}) \pm 3(^{\circ})$ | B1 | |
| 3(a)(ii) Corwen | B2 | B1 for Llangollen or Llanrhaeadr or Llanfyllin |
| 3(b) 3.5 cm represents $3.5 \times 20\,000 \div 100$ or $3.5 : 3.5 \times 20\,000 \div 100$ or 3.5×200 700 (m) | M2 A1 | Award M1 for any of the following: <ul style="list-style-type: none"> 1 cm represents 200 m $3.5 \times 20\,000$ or 70 000 $3.5 \times$ '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($^{\circ}$) (y =) 115($^{\circ}$) (z =) 73($^{\circ}$) | B1 B1 B1 | Mark answer space if completed, otherwise check diagram FT 'their 115($^{\circ}$) – 42($^{\circ}$) 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: <ul style="list-style-type: none"> $34 + 8 = 42$ 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 $4 \times 40 =$) 160(p) (Cost of muffin cases) $(12 \times 4 \div 16) \times 22$ or 3×22 (=) 66 (p) (Cost of ingredients) $(12 \times 4 \div 6) \times 25$ or 8×25 (=) 200 (p) (Money taken in selling $12 \times 4 \times 30 =$) 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 <i>Mark final answers at each stage (then possible FT)</i> <u>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</u> If previous M0, M0 award SC1 here for sight of any one of the following: <ul style="list-style-type: none"> (number of packs of muffin cases) $12 \times 4 \div 16$ and (number of multiples of ingredients) $12 \times 4 \div 6$ (number of packs of muffin cases =) 3 (number of multiples of ingredients =) 8 FT the following: <ul style="list-style-type: none"> 'their 160', provided from an attempt at 4×40, 'their 1440', provided from an attempt at $12 \times 4 \times 30$, '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) $\frac{400 - 80}{80} (\times 100)$ or equivalent <div style="text-align: right;">400 (%)</div> | 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) <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Day</th> <th>Wind speed (m.p.h.)</th> </tr> </thead> <tbody> <tr> <td>Wednesday</td> <td style="text-align: center;">1.5</td> </tr> <tr> <td>Friday</td> <td style="text-align: center;">6(.0)</td> </tr> </tbody> </table> | Day | Wind speed (m.p.h.) | Wednesday | 1.5 | Friday | 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 |
| Day | Wind speed (m.p.h.) | | | | | | | |
| Wednesday | 1.5 | | | | | | | |
| Friday | 6(.0) | | | | | | | |

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| <p>8(a) $66.36 \div 6 \times 11$ or $66.36 \div 6 \times (1 + 4 + 6)$ or $66.36 \div 6 + 4 \times 66.36 \div 6 + 66.36$ (= 11.06 + 44.24 + 66.36) or equivalent</p> <p style="text-align: right;">(£) 121.66</p> | <p>M2</p> <p>A1</p> | <p>M1 for sight of $66.36 \div 6$ or 11.06, or for sight of '11.6(0)' <i>(Note if $\times 10$ seen, check if there is indication if this was derived from $1 + 4 + 6$, if so accept for possible M2, if no evidence M0)</i></p> <p>CAO If no marks, award SC1 for an answer of (£)182.49 (from $11 \times 66.36 \div 4$)</p> |
| <p>8(b) (First year increased charge) $24 \times 0.05 + 24$ or $24 + 24 \div 10 \div 2$ or equivalent (£) 25.2(0)</p> <p>(Second year increased charge) $25.2(0) \times 0.05 + 25.2(0)$ or $25.2(0) + 25.2(0) \div 10 \div 2$ or equivalent (Increased charge after 2 years is) (£) 26.46</p> | <p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p> | <p>Accept 2520(p). Ignore units given FT 'their 25.2(0)'</p> <p>Accept 2646(p). If units are given they must be correct</p> <p>An answer of (£)26.4(0) (from $24 + 2 \times 1.20$) implies M1, A1, m0, A0</p> <p>Sight of 24×1.05^2 implies M2, also award A1 for 24×1.1025</p> |
| <p>8(c) $\frac{1}{2} \times (2.2 + 1.8) \times \text{height trapezium} + 2.2 \times 2 = 6.8$</p> <p>$2 \times \text{height trapezium} = 2.4$ or height trapezium = 1.2 (Overall length =) 3.2 (m)</p> | <p>M2</p> <p>A1</p> <p>A1</p> | <p>M1 only if brackets omitted for sum of parallel sides in the overall calculation unless dealt with correctly in further working, OR M1 for $\frac{1}{2} \times (2.2 + 1.8) \times \text{height trapezium}$ (brackets must be given or any 'missing brackets' implied by correct interpretation)</p> <p>FT 'their 1.2' + 2 provided at least M1 previously awarded</p> <p>If no marks, award SC1 for area of the trapezium as 2.4 (m²) provided not from incorrect working, e.g. $6.8 - (2.2 + 1.8 + (0).2 + (0).2) = 2.4$ is SC0 $6.8 - 2.2 \times 2 = 2.4$ is SC1</p> |
| <p>8(c) Alternative method 1: $(2 + ht \text{ trap}) \times 2.2 - 2 \times \frac{1}{2} \times [(2.2 - 1.8) \div 2] \times ht \text{ trap} = 6.8$</p> <p>Height of trapezium = 1.2 (Overall length =) 3.2 (m)</p> | <p>M2</p> <p>A1</p> <p>A1</p> | <p>M1 for $\frac{1}{2} \times [(2.2 - 1.8) \div 2] \times \text{height trapezium}$ or $2 \times \frac{1}{2} \times [(2.2 - 1.8) \div 2] \times \text{height trapezium}$</p> <p>FT 'their 1.2' + 2 provided at least M1 previously awarded</p> |
| <p>8(c) Alternative method 2: $2 \times \frac{1}{2} \times (2 + \text{overall length}) \times [(2.2 - 1.8) \div 2]$ + overall length $\times 1.8 = 6.8$</p> <p>(Overall length =) 3.2 (m)</p> | <p>M2</p> <p>A2</p> | <p>M1 for $\frac{1}{2} \times (2 + \text{overall length}) \times [(2.2 - 1.8) \div 2]$ or $2 \times \frac{1}{2} \times (2 + \text{overall length}) \times [(2.2 - 1.8) \div 2]$</p> <p>A1 for $2 \times \text{Overall length} = 6.4$ or correct simplified equation in terms of overall length</p> |
| <p>9. Unambiguous vertical line 5 cm \pm 2 mm from fence Angle bisector between house and fence $\pm 2^\circ$</p> <p>Correct intersection, position of the tree</p> | <p>B1</p> <p>B1</p> <p>B1</p> | <p>Accept a horizontal line drawn from the fence, 5cm (± 2 mm) away from the house</p> <p>FT from B1 for intersection of two straight lines provided both lines within tolerance ± 4 mm or $\pm 4^\circ$</p> <p>Award B3 if the correct position is indicated provided not from incorrect working</p> |

| <p>10(a) $(600 \div 8 =) 75$</p> <table border="1"> <thead> <tr> <th>1st</th> <th>2nd</th> <th>3rd</th> <th>4th</th> <th>5th</th> <th>6th</th> <th>7th</th> <th>8th</th> </tr> </thead> <tbody> <tr> <td>25</td> <td>100</td> <td>175</td> <td>250</td> <td>325</td> <td>400</td> <td>475</td> <td>550</td> </tr> </tbody> </table> | 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | 25 | 100 | 175 | 250 | 325 | 400 | 475 | 550 | <p>B1</p> <p>B1</p> | <p>May be seen amongst other inappropriate working, but not from 75 written in the table</p> <p>FT 'their $600 \div 8$' incorrectly evaluated</p> |
|---|---------------------|--|-----|-----|-----|-----|-----|-----|----|-----|-----|-----|-----|-----|-----|-----|---------------------|--|
| 1st | 2nd | 3rd | 4th | 5th | 6th | 7th | 8th | | | | | | | | | | | |
| 25 | 100 | 175 | 250 | 325 | 400 | 475 | 550 | | | | | | | | | | | |
| <p>10(b) States it is a random selection (from the first 75 pupils)</p> | <p>E1</p> | <p>Ignore any additional spurious statements</p> <p>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'</p> <p>Do not accept, e.g. 'selects a random odd number' 'using a systematic sampling method' without further clarification,</p> | | | | | | | | | | | | | | | | |
| <p>11(a) $(280 - 100 + 500) \div 50$ or $(280 - 100) \div 50 + 500 \div 50$</p> <p>(Sell each ticket for) (€) 13.6(0)</p> | <p>M2</p> <p>A1</p> | <p>M1 for sight of any one of the following:</p> <ul style="list-style-type: none"> $(280 + 500) \div 50$ (= €15.60) $(280 - 100) \div 50$ (= €3.60) $(- 100 + 500) \div 50$ (= €8) <p>If units are given they must be correct FT from M1 awarded</p> <p>If no marks, award SC1 for either of the following:</p> <ul style="list-style-type: none"> an answer of (€)680 (from $280 - 100 + 500$) sight of $500 \div 50$ correctly evaluated as (€)10, allow if embedded within other calculation | | | | | | | | | | | | | | | | |
| <p>11(a) <i>Alternative method:</i> $(1000 - 100) \div 250 + 500 \div 50$ or equivalent using any two points on the line, e.g. $(460 - 100) \div 100 + 500 \div 50$ $(640 - 100) \div 150 + 500 \div 50$</p> <p>(€) 13.6(0)</p> | <p>M2</p> <p>A1</p> | <p>M1 for sight of any one of the following, or equivalent:</p> <ul style="list-style-type: none"> $(1000 - 100) \div 250$ (= €3.60) $(460 - 100) \div 100$ (= €3.60) $(640 - 100) \div 150$ (= €3.60) <u>'an overall cost' - 100</u> 'number of people for that overall cost' $1000 \div 250 + 500 \div 50$ (= €14) $460 \div 100 + 500 \div 50$ (= €14.60) $640 \div 150 + 500 \div 50$ (= € 14.26 or €14.27) <u>'an overall cost'</u> + $\frac{500}{50}$ 'number of people for that overall cost' <p>If units are given they must be correct FT from M1 awarded with answer rounded or truncated to a penny</p> <p>If no marks, award SC1 for sight of $500 \div 50$ correctly evaluated as (€)10, allow if embedded within other calculation</p> | | | | | | | | | | | | | | | | |

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| <p>11(b) Considering a factor of 400 (200, 100 or 50) people or other suitable point, excluding £500 for charity, e.g.</p> <ul style="list-style-type: none"> • 'an overall cost' - 100 'number of people for that overall cost' • (200 people) $(820 - 100) \div 200$, • (100 people) $(460 - 100) \div 100$, • (50 people) $(280 - 100) \div 50$ <p>(Charity contribution) $500 \div 400$</p> <p>(Total) (£) 4.85</p> | <p>M1</p> <p>M1</p> <p>A1</p> | <p>FT 'their <u>'an overall cost'</u> - 100 'number of people for that overall cost' i.e. 'their 3.60'</p> <p>(= £3.60)</p> <p>(= £ 1.25) May be embedded within stages of calculation If units are given they must be correct</p> <p>If M0, M1, A0 also award SC1 for correct evaluation resulting from the omission of deducting £100, e.g.</p> <ul style="list-style-type: none"> • $(820 \div 200 + 1.25 = \text{£}) 5.35$ • $(460 \div 100 + 1.25 = \text{£}) 5.85$ • $(280 \div 50 + 1.25 = \text{£}) 6.85$ • correctly evaluated <u>'an overall cost'</u> + 1.25 'number of people for that overall cost' |
| <p>11(b) Alternative method: Considering total cost for 400 people, e.g. $(400 \div 50) \times (280 - 100) + 500$ or $8 \times 180 + 500$ or $1440 + 500$ or $(400 \div 100) \times (460 - 100) + 500$ or $4 \times 360 + 500$ or $(400 \div 200) \times (820 - 100) + 500$ or $2 \times 720 + 500$ or equivalent</p> <p>$\div 400$</p> <p>(£) 4.85</p> | <p>M1</p> <p>m1</p> <p>A1</p> | <p>If units are given they must be correct</p> <p>If no marks (due to omission of £100), award SC1 for $(8 \times 280 + 500) \div 400$ or SC2 for answer (£)6.85 or SC1 for $(4 \times 460 + 500) \div 400$ or SC2 for answer (£)5.85 or SC1 for $(2 \times 820 + 500) \div 400$ or SC2 for answer (£)5.35</p> |
| <p>12(a) 1×10^6 (mm²)</p> | <p>B2</p> | <p>Allow 10^6 (mm²) B1 for any one of the following</p> <ul style="list-style-type: none"> • a calculated area 1 000 000 (mm²), 1000^2, $(10^3)^2$ or equivalent • 'their clearly written number' written correctly in standard form |
| <p>12(b) 2700 $\div (0.)9(0)$ or equivalent $\div (0.)75$ or equivalent</p> <p>4000 (cm²)</p> | <p>M1</p> <p>M1</p> <p>A2</p> | <p>M marks can be awarded in either order</p> <p>Sight of $2700 \div (0.9 \times 0.75)$ is awarded M2</p> <p>A1 for $2700 \div 0.9 = 3000$ or $2700 \div 0.75 = 3600$ or for $2700 \div 0.675$ or for an appropriate FT division correctly evaluated</p> <p>(Note: sight of $2700 \div 0.675$ is awarded M2 A1)</p> |

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| <p>13.</p> <p>(Area of cross-section) $6 \times \frac{1}{2} \times 30 \times (52 \div 2)$</p> <p style="text-align: right;">2340 (mm²)</p> <p>(Volume of the box) 234000 (mm³) OR for a comparison 2340 (mm²) > 2300 (mm²)</p> | <p>M3</p> <p>A1</p> <p>A1</p> | <p><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></p> <p>M2 for $\frac{1}{2} \times 30 \times (52 \div 2)$ (= 390) M1 for any use of $52 \div 2$ (= 26) (May be embedded)</p> <p>FT 'their 2340' $\times 100$ correctly evaluated provided at least M2 previously awarded</p> |
| <p>13. Alternative method (trapezia)</p> <p>(Area of cross-section) $2 \times \frac{1}{2} \times (52 \div 2) \times (30 + 2 \times 30)$</p> <p style="text-align: right;">2340 (mm²)</p> <p>(Volume of the box) 234000 (mm³) OR for a comparison 2340 (mm²) > 2300 (mm²)</p> | <p>M3</p> <p>A1</p> <p>A1</p> | <p>M2 for $\frac{1}{2} \times (52 \div 2) \times (30 + 2 \times 30)$ (= 1170) M1 for use of $52 \div 2$ (= 26)</p> <p>FT 'their 2340' $\times 100$ correctly evaluated provided at least M2 previously awarded</p> |
| <p>13. Alternative method ($\frac{1}{2}ab\sin C$)</p> <p>(Area of cross-section) $6 \times \frac{1}{2} \times 30 \times 30 \times \frac{\sqrt{3}}{2}$</p> <p style="text-align: right;">1350$\sqrt{3}$ or 2338(.2 mm²) or 2340 (mm²)</p> <p>(Volume of box) 233820 mm³ or 234000 (mm³) OR for a comparison 2338(.2 mm²) > 2300 (mm²)</p> | <p>M3</p> <p>A1</p> <p>A1</p> | <p>M2 for $\frac{1}{2} \times 30 \times 30 \times \frac{\sqrt{3}}{2}$ M1 for $(6 \times) \frac{1}{2} \times 30 \times 30 \times \sin 60^\circ$</p> <p>FT 'their 2340' $\times 100$ correctly evaluated provided at least M2 previously awarded</p> |
| <p>13. Alternative method (triangle area)</p> <p>(Area of triangle) $\frac{1}{2} \times 30 \times (52 \div 2)$</p> <p>(Minimum area of triangle required) $2300 \div 6$ 383(.33...)</p> <p>Comparison 390 > 383(.33...)</p> | <p>M2</p> <p>M1</p> <p>A1</p> <p>A1</p> | <p>(= 390)</p> |