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# **GCSE MARKING SCHEME**

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**AUTUMN 2018**

**GCSE  
MATHEMATICS – NUMERACY  
UNIT 2 - FOUNDATION TIER  
3310U20-1**

## **INTRODUCTION**

This marking scheme was used by WJEC for the 2018 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 (3310U20-1)

## AUTUMN 2018 MARK SCHEME

GCSE Mathematics – Numeracy Unit 2: Foundation Tier	Mark	Comment																												
1.(a) 44 (years old)	B1	<i>Note: this paper was sat in November 2018</i>																												
1.(b) nine hundred (and) thirty-one thousand, five hundred and eleven.	B1																													
1.(c) 600 seconds	B1																													
1.(d) 308 (days)	B1																													
1.(e) 13 (rows)	B2	B1 for 14 (rows) or 13.6(9...)(rows) or 13.7(rows) or 13 (rows) remainder 51 OR sight of $1000 \div 73$ or equivalent Allow sight of $73 \times 13 = 949$ OR $73 \times 14 = 1022$ for B1																												
2.(a) 6 million	B1																													
2.(b) ✓  <div style="text-align: center; border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="padding: 2px;">Website</th> <th style="padding: 2px;">UK users (millions)</th> </tr> </thead> <tbody> <tr> <td style="padding: 2px;">Facebook</td> <td style="padding: 2px;">32</td> </tr> <tr> <td style="padding: 2px;">Twitter</td> <td style="padding: 2px;">16</td> </tr> <tr> <td style="padding: 2px;">Snapchat</td> <td style="padding: 2px;">10</td> </tr> <tr> <td style="padding: 2px;">Instagram</td> <td style="padding: 2px;">14</td> </tr> </tbody> </table> </div> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; border: 1px solid black; padding: 2px;">Twitter</td> <td style="width: 15%; border: 1px solid black; text-align: center;">□</td> <td style="width: 15%; border: 1px solid black; text-align: center;">□</td> <td style="width: 15%; border: 1px solid black;"></td> <td style="width: 15%; border: 1px solid black;"></td> <td style="width: 15%; border: 1px solid black;"></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">Snapchat</td> <td style="border: 1px solid black; text-align: center;">□</td> <td style="border: 1px solid black; text-align: center;">┌ OR ┌</td> <td style="border: 1px solid black;"></td> <td style="border: 1px solid black;"></td> <td style="border: 1px solid black;"></td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">Instagram</td> <td style="border: 1px solid black; text-align: center;">□</td> <td style="border: 1px solid black; text-align: center;">┌ OR ┌</td> <td style="border: 1px solid black;"></td> <td style="border: 1px solid black;"></td> <td style="border: 1px solid black;"></td> </tr> </table>	Website	UK users (millions)	Facebook	32	Twitter	16	Snapchat	10	Instagram	14	Twitter	□	□				Snapchat	□	┌ OR ┌				Instagram	□	┌ OR ┌				<p style="text-align: center;">B1</p> <p style="text-align: center;">B1</p> <p style="text-align: center;">B1</p> <p style="text-align: center;">B1</p> <p style="text-align: center;">B1</p> <p style="text-align: center;">B1</p> <p style="text-align: center;">B1</p>	<p>Answers in table and pictogram take precedence.</p> <p>F.T 'their 32' <math>\div 2</math></p> <p>If millions written in full (e.g. 32 000 000) penalise first time only.</p> <p>2 symbols drawn F.T 'their 16'</p> <p>1¼ symbols drawn Allow intention of ¼ symbol drawn (if a strip is drawn must be less than half a symbol)</p> <p>1¾ symbols drawn F.T 'their 14' drawn provided not a multiple of 8 Allow intention of ¾ symbol drawn (if a strip is drawn must be greater than half and less than a whole)</p>
Website	UK users (millions)																													
Facebook	32																													
Twitter	16																													
Snapchat	10																													
Instagram	14																													
Twitter	□	□																												
Snapchat	□	┌ OR ┌																												
Instagram	□	┌ OR ┌																												

<p>2. (c) <b>No stated</b> or implied and valid explanation  e.g. "Half of 65640000 is 32820000 which is more than 32000000"  "Double 32 million is 64 million which is less than 65 (or 66) million"  "32 million is less than half the population"</p>	<p>E1</p>	<p>F.T 'their 32 million' from (b) with correct conclusion</p> <p>Do not accept  No and "because 32 million used facebook"  No and "65 640 000 ÷ 2 = 32 820 000"  No and " 32 + 32 = 64"</p>
<p>2. (d)(i)  <math>15 \times 60</math>      OR      <math>870 \div 60</math>  900 (mins)                      14.5 (hours)  <b>and False</b>                      <b>and False</b></p>	<p>M1  A1</p>	<p>ISW  Accept 14(...) hours  False needs to be stated or clearly implied  Do not accept "there's not 870 minutes in 15 hours"</p>
<p>(d)(ii)  Sight of  <math>75 \times 7</math> <b>and True</b> OR  <math>525 \div 7</math> <b>and True</b> OR  <math>525 \div 75</math> <b>and True</b></p>	<p>B2</p>	<p>B1 for sight of  <math>75 \times 7</math> OR <math>525 \div 7</math> OR <math>525 \div 75</math>  Do not accept "Alfie spends 525 minutes"</p>

<p>3. ✓          (Length of fence =)  <math>5.4(m) + 9(m) + 5.4(m)</math>  <math>= 19.8(m)</math></p> <p>(Total number of panels =) <math>19.8 \div 1.8</math>          11</p> <p>(Cost =) <math>11 \times (\pounds)18.69</math>  <math>(\pounds)205.59</math>  <math>(\pounds)206(.00)</math></p>	<p>M1 A1</p> <p>M1 A1</p> <p>M1 A1 B1</p>	<p>Must be total of 3 sides for M1</p> <p>F.T 'their 19.8' <math>\div 1.8</math>          Answer must be rounded up if necessary</p> <p>F.T 'their derived 11' <math>\times (\pounds)18.69</math>          F.T 'their derived <math>(\pounds)205.59</math>'</p>
<p>3. <i>Alternative method</i>          (Finding number of panels on 1 side =)  <math>5.4(m) \div 1.8(m)</math> OR <math>9 \div 1.8(m)</math>          3(pannels) AND 5 (pannels)</p> <p>(Finding the cost of the panels = )  <math>(2 \times) 3 \times (\pounds)18.69</math> OR <math>5 \times (\pounds)18.69</math>  <math>(\pounds)112.14</math> AND <math>(\pounds)93.45</math></p> <p>(Total cost =) <math>(\pounds)112.14 + (\pounds)93.45</math>  <math>(\pounds)205.59</math>  <math>(\pounds)206(.00)</math></p>	<p>M1 A1</p> <p>M1 A1</p> <p>M1 A1 B1</p>	<p>F.T 'their derived 3' or 'their derived 5' but must be whole number          Not for <math>\pounds56.07</math></p> <p>F.T 'their <math>(\pounds)112.14</math>' + 'their <math>(\pounds)93.45</math>'          M1 for <math>11 \times (\pounds)18.69</math> or          ('their 5' + 'their 6') <math>\times (\pounds)18.69</math>          CAO          F.T 'their derived <math>(\pounds)205.59</math>'</p> <p><i>If last two M1s not awarded, allow SC2 for sight of 11(pannels)</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"> <li>• present their response in a structured way</li> <li>• explain to the reader what they are doing at each step of their response</li> <li>• lay out their explanations and working in a way that is clear and logical</li> <li>• write a conclusion that draws together their results and explains what their answer means</li> </ul> <p>For W1, candidates will be expected to:</p> <ul style="list-style-type: none"> <li>• show all their working</li> <li>• make few, if any, errors in spelling, punctuation and grammar</li> <li>• use correct mathematical form in their working</li> <li>• use appropriate terminology, units, etc.</li> </ul>

4. (a) 5.5 lb	B1							
4. (b) $20 \times 4 + 20$ 100 (minutes)	M1 A1	ISW Allow 1 hour 40 (minutes)						
4. (c) (3 kg $\Rightarrow$ ) 6.6 (lb)  Correct substitution into correct formula (e.g. $30 \times 6.6 + 30$ )  Correct answer (e.g. 228 (minutes))	B1  M1  A1	Answer may be seen on graph Allow answer between 6.5(lb) and 6.7(lb)  May be implied in later working F.T 'their 6.6'. <b>Do not</b> accept $30 \times 3 + 30$ for M1 <table border="1" data-bbox="858 613 1350 810"><tr><td>6.5</td><td><math>30 \times 6.5 + 30 = 225</math> (minutes) 195 + 30 3 hours 45 (mins)</td></tr><tr><td>6.6</td><td><math>30 \times 6.6 + 30 = 228</math> (minutes) 198 + 30 3 hours 48 (mins)</td></tr><tr><td>6.7</td><td><math>30 \times 6.7 + 30 = 231</math> (minutes) 201 + 30 3 hours 51 (mins)</td></tr></table> ISW Allow answers in hours and minutes	6.5	$30 \times 6.5 + 30 = 225$ (minutes) 195 + 30 3 hours 45 (mins)	6.6	$30 \times 6.6 + 30 = 228$ (minutes) 198 + 30 3 hours 48 (mins)	6.7	$30 \times 6.7 + 30 = 231$ (minutes) 201 + 30 3 hours 51 (mins)
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6.7	$30 \times 6.7 + 30 = 231$ (minutes) 201 + 30 3 hours 51 (mins)							
5(a)(i) $46 \times 0.78$ or $46 - 46 \times 0.22$ (£)35.88	M1 A1	Or equivalent ( $46 - 10.12$ )						
5(a)(ii) $\frac{5 \times 43.6(0)}{8}$ or $43.6(0) - \frac{3 \times 43.6(0)}{8}$  (£)27.25	M1  A1	Or equivalent ( $43.6(0) - 16.35$ ) Accept use of 0.375 or 0.625 Allow use of 0.38 or 0.62 for M1 only  <i>If no marks in (i) and (ii), award SC1 in (ii) for answers of (£)10.12 <b>and</b> (£)16.35 respectively</i>						
5(b) $\frac{6}{43}$	B1							

<p>6. Red paint 500ml 1 tin</p> <p><math>(250 \div 5) \times 200</math> or <math>50 \times 200</math> or <math>40 \times 250</math> or <math>20 \times 500</math> or equivalent calculation that could lead to 10 000</p> <p>OR</p> <p>sight of 40 : 2 : 1 or equivalent (not 200 : 10 : 5 alone)</p> <p>10 000 ml white paint</p> <p>White paint 1 litre 10 tins</p> <p>12 tins of paint altogether</p>	<p>B1</p> <p>M1</p> <p>A1</p> <p>A2</p> <p>B1</p>	<p>Allow Red paint 250ml with 2 tins</p> <p>FT 20 × 'their quantity of red paint' from the table</p> <p>OR 10 litres</p> <p>CAO</p> <p>A1 for any one of</p> <ul style="list-style-type: none"> <li>• 20 tins 500 ml white</li> <li>• 40 tins 250 ml white</li> <li>• 10 (tins) recorded in the table for white without '1 litre' or with 10 000ml, 10 litres</li> <li>• 20 × 'their quantity of red paint' correctly evaluated with correct decisions regarding possible number and size of tins (need not be least number of tins)</li> <li>• provided M1 awarded for 'their 10000 ml' used correctly to find minimum number of appropriate size tin, including if necessary any rounding up</li> </ul> <p>CAO must from sum of 1 + 1 + 10 with evidence of 10 000 ml white paint</p> <p>Award SC marks as detailed:</p> <p>Total amount of paint, use of 250ml tins:</p> <table border="1" data-bbox="858 1220 1220 1377"> <tr> <td>Red <b>500 ml</b></td> <td><b>2</b></td> </tr> <tr> <td>White <b>10 litres</b> or <b>10000 ml</b></td> <td><b>40</b></td> </tr> <tr> <td>Total number of tins</td> <td><b>43</b></td> </tr> </table> <p>Overall marks are B0, M1, A1 and <b>SC2</b></p> <p>Total amount of paint, use of 500ml tins:</p> <table border="1" data-bbox="858 1467 1220 1624"> <tr> <td>Red <b>500 ml</b></td> <td><b>1</b></td> </tr> <tr> <td>White <b>10 litres</b> or <b>10000 ml</b></td> <td><b>20</b></td> </tr> <tr> <td>Total number of tins</td> <td><b>22</b></td> </tr> </table> <p>Overall marks are B1, M1, A1 and <b>SC1</b></p>	Red <b>500 ml</b>	<b>2</b>	White <b>10 litres</b> or <b>10000 ml</b>	<b>40</b>	Total number of tins	<b>43</b>	Red <b>500 ml</b>	<b>1</b>	White <b>10 litres</b> or <b>10000 ml</b>	<b>20</b>	Total number of tins	<b>22</b>
Red <b>500 ml</b>	<b>2</b>													
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Total number of tins	<b>43</b>													
Red <b>500 ml</b>	<b>1</b>													
White <b>10 litres</b> or <b>10000 ml</b>	<b>20</b>													
Total number of tins	<b>22</b>													

<p>7. (Tablets £) <math>(55 + 48) \times 220 (= \text{£ } 22660)</math></p> <p>(Covers £) <math>(48 + 14) \times 18 (= \text{£ } 1116)</math></p> <p>(£) 23 776</p>	<p>M1</p> <p>M1</p> <p>A1</p>	<p>Allow with missing brackets</p> <p>Allow with missing brackets</p> <p>CAO</p>
<p>7. <i>Alternative method:</i></p> <p><math>55 \times 220 + 48 \times (220 + 18) + 14 \times 18</math>  <math>(= 12\,100 + 11\,424 + 252)</math></p> <p>OR</p> <p><math>55 \times 220 + 48 \times 220 + 48 \times 18 + 14 \times 18</math>  <math>(= 12\,100 + 10\,560 + 864 + 252)</math></p> <p>(£) 23 776</p>	<p>M2</p> <p>A1</p>	<p>Allow with missing brackets</p> <p><i>M1 for:</i></p> <p><i>Sight of any 1 of the following:</i></p> <ul style="list-style-type: none"> <li>• <math>55 \times 220 + 14 \times 18</math></li> <li>• <math>48 \times (220 + 18)</math></li> <li>• 12 100, 10560, 864 and 252</li> <li>• 12100, 11424 and 252</li> </ul> <p>CAO</p>
<p>8(a) Profit: sight of 5% or 18/360 or 1/20 or 0.05</p> <p>Any of the following methods, or equivalent</p> <ul style="list-style-type: none"> <li>• <math>0.05 \times 9100</math> (million)</li> <li>• <math>0.05 \times 9\,100\,000\,000</math></li> <li>• <math>9100</math> (million) – <math>0.95 \times 9100</math></li> <li>• <math>9100\,000\,000 - 0.95 \times 9100\,000\,000</math></li> </ul> <p>(£) 455 (million)</p>	<p>B1</p> <p>M1</p> <p>A1</p>	<p>Allow for sight of 16/360 to 20/360</p> <p>Award of M1 implies previous B1 FT 'their 100-50-25-10-5-5' or use of 16/360 to 20/360 Allow embedded '5%' within a repeated subtraction from 9100 million Allow place value error from misinterpretation of million, i.e. <math>0.05 \times 9100(0\dots)</math> Do not allow for 5% of 9100 (million) or equivalent seen without convincing working or an answer implying 'x' has been used</p> <p>CAO mark final answer, this being the answer line if completed Allow for (£) 455 000 000 (including in the answer space)</p>
<p>8(b) 370 000</p>	<p>B1</p>	



<p>8(c) Any one of:</p> <ul style="list-style-type: none"> <li>• <math>\frac{(900 - 828)}{900} (\times 100 = 8\%)</math></li> <li>• <math>0.08 \times 900 (=72)</math></li> <li>• <math>0.92 \times 900 (= 828)</math></li> <li>• <math>100 \times 828 \div (100 - 8) (= 900)</math></li> <li>• <math>828 \div 900 (\times 100) (= 0.92 (92\%))</math></li> </ul> <p>Indicates or implies 'Yes' AND as appropriate:</p> <ul style="list-style-type: none"> <li>• <math>\frac{((900 - 828) \times 100)}{900} (=) 8\%</math></li> <li>• <math>(900 - 72 =) 828</math> OR <math>(828 + 72 =) 900</math></li> <li>• <math>(0.92 \times 900 =) 828</math></li> <li>• <math>(100 \times 828 \div (100 - 8) =) 900</math></li> <li>• <math>(100\% - 92\% =) 8\%</math></li> </ul>	<p>M1</p> <p>A1</p>	<p>A correct evaluation of an appropriate calculation implies 'Yes' irrespective of the box ticked</p> <p>Match 'A' mark to corresponding 'M' mark, i.e. 1<sup>st</sup> bullet points match, 2<sup>nd</sup> bullet points match, etc.</p>
<p>8(d) (Electricity cost is) <math>828 \times (\pounds)0.18</math> <math>(\pounds)149.04</math> or <math>14904(p)</math></p> <p>(Cost of electricity and standing charge is <math>\pounds 149.04 + 65 =) (\pounds) 214.04</math></p> <p>(Total bill includ VAT at 5% <math>(\pounds)10.70(2)</math>) <math>1.05 \times 214.04</math> or equivalent <math>(\pounds)224.74(2)</math></p>	<p>M1</p> <p>A1</p> <p>B1</p> <p>M1</p> <p>A1</p>	<p>Accept <math>828 \times 18(p)</math></p> <p>If units are given they must be correct</p> <p>Accept <math>\pounds 149.04p</math></p> <p>FT provided 828 used in a calculation for 'their cost of electricity'</p> <p>FT from 'their total of electricity and standing charge'</p> <p>Allow <math>(\pounds)224.75</math></p>
<p>9(a) Sight of (\$) 12000</p> <p>(Tax at 20%) <math>0.20 \times 12000 (= \\$ 2400)</math></p>	<p>B1</p> <p>B1</p>	<p>Ignore <math>\pounds</math> for <math>\\$</math></p>
<p>9(b)</p> <p>(Tax at 25%) <math>0.25 \times 3000</math> or <math>0.25 \times (25000 - 22000)</math> or equivalent</p> <p style="text-align: right;">(\$) 750</p> <p>Total tax due (\$) 3150</p> <p>Refund due <math>(4000 - 3150 =) (\\$) 850</math></p>	<p>M2</p> <p>A1</p> <p>B1</p> <p>B1</p>	<p>Ignore <math>\pounds</math> for <math>\\$</math></p> <p>M1 for <math>25000 - 22000 (= \\$3000)</math></p> <p>CAO, not FT</p> <p>Allow for the correct sum of 2 amounts of tax derived from use of 20% and 25% rates</p> <p>FT 4000 – 'their derived 3150' provided 'their derived 3150' &lt; 4000 and 'their derived 3150' <math>\neq</math> 2400</p>
<p>9(b) <i>Alternative method:</i> <i>Sight of 25000 – 22000 (= \$3000)</i></p> <p><i>25000 -</i> <i>(0.80 <math>\times</math> 12000 + 0.75 <math>\times</math> 3000 + 10000)</i></p> <p><i>Tax due (\$) 3150</i> <i>Refund due (\$) 850</i></p>	<p>B1</p> <p>M2</p> <p>A1</p> <p>B1</p>	<p>M1 for sight of <math>0.80 \times 12000 + 0.75 \times 3000 + 10000</math></p> <p>FT 4000 – 'their derived 3150' provided 'their derived 3150' &lt; 4000 and 'their derived 3150' <math>\neq</math> 2400</p>

