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# **GCSE MARKING SCHEME**

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**AUTUMN 2016**

**MATHEMATICS - NUMERACY (NEW)  
UNIT 2 - FOUNDATION TIER**

**3310U20-1**

## **INTRODUCTION**

This marking scheme was used by WJEC for the 2016 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.

| GCSE Mathematics – Numeracy<br>Unit 2: Foundation Tier<br>Autumn 2016                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Mark                                                                                                      | Comment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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| 1. (a) Evidence of counting appropriate squares.<br>(number of squares) 41 – 50<br><br>(approximate area)<br>656 (km <sup>2</sup> ) to 800(km <sup>2</sup> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | M1<br><br>A1<br><br>A1                                                                                    | Accept areas of blocks of rectangles.<br><br>Number of squares in range with no evidence of counting, M1 A1<br><br>FT 'their number of squares'.<br>Answer in range with no workings, M1 A1 A1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| (b) 15, 17 identified as middle two numbers.<br>OR 10, 13, 14, 15, 17, 17,19, 20<br><br>Median= 16 (miles)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | M1<br><br>A1                                                                                              | For identifying the correct <b>TWO</b> middle numbers<br>OR for arranging the 8 numbers in ascending or descending order.<br>C.A.O.<br>Unsupported 16 gets M1, A1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 2 (a) (1 child's breakfast =) (£) 3.75<br>(4 toast and jam=) (£) 3.8(0)<br>(3 teas and 2 coffees=) (£) 9.25<br>(Total=) (£) 31.8(0)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | B1<br>B1<br>B1<br>B1                                                                                      | Penalise -1 <b>once only</b> for values given in pence.<br><br>FT all three values in table.<br>Do not penalise the same error twice.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| (b) (Mr Jones pays 10+10+5+5+5 = £35)<br>(Tip or Change =) 10+10+5+5+5 – 31.8(0)<br><br>(Tip given to the waitress =) (£)3.2(0)<br><br>(Reasonable tip 10% of 31.80 =)<br>31.8 ÷ 10 or equivalent<br><br>(£)3.18 <b>AND</b> a suitable conclusion e.g. Mr Jones gives a reasonable tip (as it is 2 pence more than the minimum suggested).<br><br>For OC1, candidates will be expected to:<br>• present their response in a structured way<br>• explain to the reader what they are doing at each step of their response<br>• lay out their explanations and working in a way that is clear and logical<br>• write a conclusion that draws together their results and explains what their answer means.<br><br>For W1, candidates will be expected to:<br>• show all their working<br>• make few, if any, errors in spelling, punctuation and grammar<br>• use correct mathematical form in their working<br>• use appropriate units eg. £ and p. | M1<br><br>A1<br><br>M1<br><br><br><br><br>A1<br><br><br><br>OC1<br><br><br><br><br><br><br><br><br><br>W1 | FT 'their (£)31.8(0)' from (a) provided it is less than £35.<br><br>Award M1 for sight of 10% of 'their (£)31.8(0)' correctly evaluated. FT 'their (£)31.8(0).<br><br>Ignore rounding errors for M1 if 10% of each table value in (a) is calculated.<br><br>On FT, accept a conclusion consistent with 'their £31.80'. e.g. for an answer of £33 in (a) accept £3.30 and 'Mr Jones does not give a reasonable tip'.<br><br>If no marks awarded, allow SC1 for 10% of (£)35 = (£)3.5(0)<br><br><i>Alternative: for second M1 A1.</i><br><i>(35 – 31.80)/31.80 × 100 (%)</i> <span style="float:right">M1</span><br><i>=10.06(2893.) % <b>AND</b> a suitable conclusion.</i><br><i>e.g. Mr Jones gives a reasonable tip as this is more than 10%.</i> <span style="float:right">A1</span><br><br><i>Alternative:</i><br><i>(A reasonable tip =) 31.8 ÷ 10 = (£)3.18</i> <span style="float:right">B1</span><br><i>(Total with reasonable tip =) (£)31.80 + (£)3.18</i> <span style="float:right">M1</span><br><i>= (£)34.98</i> <span style="float:right">A1</span><br><i>(£35 - £34.98= 2p) with a suitable conclusion.</i> <span style="float:right">A1</span><br><i>e.g. The tip is reasonable as he is paid (2p) more.</i> |

| GCSE Mathematics – Numeracy<br>Unit 2: Foundation Tier<br>Autumn 2016                                                                                                                                                                                                                                                   | Mark                     | Comment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3(a) 2 254 219                                                                                                                                                                                                                                                                                                          | B1                       | In table or on answer lines.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| (b) 1 358 971 – (395 019 + 496 249)<br><br>467 703                                                                                                                                                                                                                                                                      | M1<br>A1                 | May be seen in stages                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| (c) Labelling on the horizontal axis and bars<br>of equal width.<br>Bars of correct height.                                                                                                                                                                                                                             | B1<br>B1                 | Accept with or without gaps between bars.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 4 (a) 4 hours 17 min or equivalent                                                                                                                                                                                                                                                                                      | B1                       | Allow 4:17 or 4.17 or 257 (mins)<br>If units given, they must be correct.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 4 (b)(i) $200 \div 50 \times 5.9(0)$ or equivalent<br><br>(£)23.6(0)                                                                                                                                                                                                                                                    | M1<br>A1                 | May be seen in stages.<br>Adding four lots of (£)5.9(0) earns M1<br>If units given, they must be correct.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 4(b)(ii) 3 (breaks)                                                                                                                                                                                                                                                                                                     | B1                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 4(b)(iii) 7:30 (a.m.) or (0)7:30                                                                                                                                                                                                                                                                                        | B1                       | Do NOT accept 7:30 p.m.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 5. (a) True<br>True<br>True<br>False                                                                                                                                                                                                                                                                                    | B2                       | B1 for any three correct.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| (b) Engaging in appropriate calculations using<br>the formula, sufficient to draw a conclusion.<br>e.g. Hire cost for 2 days = £102 AND<br>hire cost for 3 days = £144.<br><br>Appropriate explanation<br>e.g. £124 is between £102 and £144 so the<br>number of days is between 2 and 3 so it is not<br>a whole number | B1<br><br>E1             | The working and the explanation need to be<br>considered together for the award of B1 E1.<br><br>OR e.g. Hire cost for 2 days = (£)102<br>Each extra day costs £42<br>(£124) is only (£)22 more and so is not enough for<br>an extra day.<br><br><i>Alternative:</i><br>$\text{Number of days} = (124 - 18) / 42$ <span style="float: right;">B1</span><br>$(=2.5238095\dots)$<br><i>The number of days must be a whole number so<br/>the number of days cannot be a decimal</i> <span style="float: right;">E1</span><br><br><i>Alternative:</i><br>$124 - 18 = (£)106$<br>$106 - 42 - 42 = (£)22$ <span style="float: right;">B1</span><br><i>(£) 22 is not enough for another day.</i> <span style="float: right;">E1</span> |
| 6. (Number of tiles needed=) $6 \times 2 \times 8 \times 2$<br><br>192 (tiles)<br><br>(Cost =) $192 \times 2.5(0)$<br>(£)480                                                                                                                                                                                            | M1<br>A1<br><br>M1<br>A1 | OR $8 \times 6 \div (0.5 \times 0.5)$<br>OR $8 \times 6 \times 4$<br><br>FT 'their derived 192' $\neq 48$<br>'Their 192' must be derived from consideration of<br>dimensions of the room and of the tile.<br><br><i>If no marks, award SC1 for <math>48 \times 2.50 = (£)120</math><br/>(£)480 unsupported gains full marks.</i>                                                                                                                                                                                                                                                                                                                                                                                                |

| GCSE Mathematics – Numeracy<br>Unit 2: Foundation Tier<br>Autumn 2016                                                                                                                                                                                                                              | Mark                             | Comment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7(a) 6 km                                                                                                                                                                                                                                                                                          | B1                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 7(b) 19:30                                                                                                                                                                                                                                                                                         | B1                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 7(c) 18:30                                                                                                                                                                                                                                                                                         | B1                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 7(d) Explanation, e.g. 'still the same distance from home', 'keeping the same distance', 'he was 6 km away from home for the whole time', 'his distance stayed at 6 km from home', 'does not change distance during this time', 'didn't go any further from home', 'didn't get any closer to home' | E1                               | <p>Ignore additional incorrect statements except when it implies he was stopped</p> <p>Accept, e.g. 'he was jogging on the spot', 'he was climbing a tower block', 'walking on a circular path (centred on his home)', 'kept a constant distance', 'he was walking but keeping the distance from home'</p> <p>Allow, e.g. 'he was stuck in traffic he is still on his journey'</p> <p>Do not accept, e.g. 'turning round to head for the supermarket', 'he is going in the same direction for 30 minutes', 'could be stuck in traffic', 'he had a break as the distance didn't change showing he stayed in the same place', 'stayed in the same place for 30 minutes', 'he is at the supermarket', 'he was walking the same distance for 30 minutes'</p>                                                                                                                                                                                   |
| 8(a) $450 \times 99.4(0)$<br>44 730 (rupees)                                                                                                                                                                                                                                                       | M1<br>A1                         | <p>If units are given they must be correct</p> <p><i>If no marks, award SC1 for sight of digits 4473(0) irrespective of place value</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 8(b) $(450 \times 99.72 =)$ 44 874 (rupees)<br><br>Means he can buy 44 500 (rupees) or 89 (500 rupee notes)<br><br>$44\,500 \div 99.72$ or<br>$450 - (44\,874 - 44\,500) \div 99.72$<br><br>(£) 446.25                                                                                             | B1<br><br>B1<br><br>M1<br><br>A1 | <p>B1 for sight of <math>(500 \div 99.72 =)</math> (£)5.01(40...)</p> <p>OR B1 for sight of <math>44\,874 \div 500 (=89.748...)</math> <b>AND</b> <math>89 \times 500 = 44\,500</math><br/>OR B1 for sight of <math>450 \div 5.01(40...) (=89.748...)</math> <b>AND</b> <math>89 \times 500 = 44\,500</math> or 89 notes</p> <p>FT rounding down to nearest 500 rupees provided <math>450 \times 99.72</math> attempted</p> <p>OR M1 for sight of <math>446.25 \times 99.72 = 44500</math> from trial &amp; improvement<br/>FT 'their 44 500' provided it is a multiple of 500 provided at least B1 previously awarded</p> <p>CAO</p> <p><u>Use of 99.40 rupees in (b)</u><br/> <math>(450 \times 99.40 =)</math> 44 730 (rupees) B0<br/> Means he can buy 44 500 (rupees) or B1<br/> 89 (500 rupee notes)<br/> <math>44\,500 \div 99.40</math> or<br/> <math>450 - (44\,730 - 44\,500) \div 99.40</math> M1<br/> (£) 447.69 A0 as CAO</p> |



| GCSE Mathematics – Numeracy<br>Unit 2: Foundation Tier<br>Autumn 2016                                                                                                                                                                                                                      | Mark                                                   | Comment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |                      |                                   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
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| 10(a)<br><br>(Eleri pays $6 \times £84.50 =$ ) (£)507<br><br>(Nerys pays) $\frac{2}{3} \times 6 \times 84.5(0)$<br><br>+ 30<br>Amount in the range (£) 367.98 to (£)368.04<br><br>(Nerys pays £507 – (£367.98 to 368.04) less than Eleri)<br>An answer in the range (£)138.96 to (£)139.02 | <br><br>B1<br><br>M1<br><br>m1<br>A1<br><br><br><br>B1 | Treat use of 0.333, 0.666 or 0.67 as PA-1, do not accept 0.3 or 0.6 as $\frac{1}{3}$ or $\frac{2}{3}$ respectively<br>(Note $\frac{1}{3} \times 84.50 = 28.1666\dots$ )<br>( $\frac{2}{3} \times 84.50 = 56.333\dots$ )<br><br>Or $6 \times 84.5(0) - \frac{1}{3} \times 6 \times 84.5(0)$<br>FT $\frac{2}{3} \times$ 'their $6 \times 84.5(0)$ '<br><br>(Reminder: Depends on both the M and the m mark awarded)<br><br>FT provided attempt $6 \times £84.50$ for Eleri and M1 & m1 awarded for Nerys.<br>(Omitting the cost of the Railcard gives £169, B0)<br><br>Treat single journey considered as MR-1<br>(Eleri pays $3 \times 84.50 =$ ) £253.50 B1<br>(Nerys pays) $\frac{2}{3} \times £253.50$ M1<br>+30 m1<br>= (£)198.99 to (£)199.02 A1<br>(difference of) (£)54.48 to (£)54.51 B1<br>(depends on attempt $3 \times 84.50$ and M1, m1)<br><br>AND also similar to the alternative shown below<br><br><u>Alternative looking directly at the saving:</u><br>(Nerys saves=) $\frac{1}{3} \times 6 \times (£)84.50$ M2<br>(£)168.96 to (£)169.02 A1<br>– 30 m1<br>(FT 'their 169' – 30)<br>(=£) 138.96 to (£)139.02 A1 |           |                      |                                   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 10(b) $\frac{1}{3} \times 7(. )80$<br>$30 \div 2.60$<br><br>He would need to make 12 (single) journeys (or more) or 6 return journeys (or more)                                                                                                                                            | M1<br>M1<br><br>A1                                     | FT 'their $\frac{1}{3} \times 7(. )80$ ' incorrectly evaluated<br>Note: Break-even is 11.538 single journeys.<br><br>CAO<br>Allow 'if he goes (at least) once a month'<br><br>Alternative:<br>M1 for any one correct discounted return or single cost<br>M1 for method for the equivalent of 12 single or 6 returns, full and discounted costs, with sight of considering also the £30<br>A1 For either 6 return journeys or 12 singles, with no incorrect working seen<br><br><table border="1"> <thead> <tr> <th>Return, £</th><th>Discounted return, £</th><th>Discounted + cost of rail card, £</th></tr> </thead> <tbody> <tr><td>15.60</td><td>10.40</td><td>40.40</td></tr> <tr><td>31.20</td><td>20.80</td><td>50.80</td></tr> <tr><td>46.80</td><td>31.20</td><td>61.20</td></tr> <tr><td>62.40</td><td>41.60</td><td>71.60</td></tr> <tr><td>78.00</td><td>52.00</td><td>82.00</td></tr> <tr><td>93.60</td><td>62.40</td><td>92.40</td></tr> </tbody> </table>                                                                                                                                                         | Return, £ | Discounted return, £ | Discounted + cost of rail card, £ | 15.60 | 10.40 | 40.40 | 31.20 | 20.80 | 50.80 | 46.80 | 31.20 | 61.20 | 62.40 | 41.60 | 71.60 | 78.00 | 52.00 | 82.00 | 93.60 | 62.40 | 92.40 |
| Return, £                                                                                                                                                                                                                                                                                  | Discounted return, £                                   | Discounted + cost of rail card, £                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |                      |                                   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 15.60                                                                                                                                                                                                                                                                                      | 10.40                                                  | 40.40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |                      |                                   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 31.20                                                                                                                                                                                                                                                                                      | 20.80                                                  | 50.80                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |                      |                                   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 46.80                                                                                                                                                                                                                                                                                      | 31.20                                                  | 61.20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |                      |                                   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 62.40                                                                                                                                                                                                                                                                                      | 41.60                                                  | 71.60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |                      |                                   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 78.00                                                                                                                                                                                                                                                                                      | 52.00                                                  | 82.00                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |                      |                                   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
| 93.60                                                                                                                                                                                                                                                                                      | 62.40                                                  | 92.40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |           |                      |                                   |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |

