



GCSE MARKING SCHEME

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 Unit 2: Foundation Tier Autumn 2016	Mark	Comment
3(a) 2 254 219	B1	In table or on answer lines.
(b) 1 358 971 – (395 019 + 496 249) 467 703	M1 A1	May be seen in stages
(c) Labelling on the horizontal axis and bars of equal width. Bars of correct height.	B1 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) If units given, they must be correct.
4 (b)(i) 200 ÷ 50 × 5.9(0) or equivalent (£)23.6(0)	M1 A1	May be seen in stages. Adding four lots of (£)5.9(0) earns M1 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 True True False	B2	B1 for any three correct.
(b) Engaging in appropriate calculations using the formula, sufficient to draw a conclusion. e.g. Hire cost for 2 days = £102 AND hire cost for 3 days = £144. Appropriate explanation e.g. £124 is between £102 and £144 so the number of days is between 2 and 3 so it is not a whole number	B1 E1	The working and the explanation need to be considered together for the award of B1 E1. OR e.g. Hire cost for 2 days = (£)102 Each extra day costs £42 (£124) is only (£)22 more and so is not enough for an extra day. <i>Alternative:</i> <i>Number of days = (124 – 18) / 42</i> <i>B1</i> <i>(=2.5238095...)</i> <i>The number of days must be a whole number so the number of days cannot be a decimal</i> <i>E1</i> <i>Alternative:</i> <i>124 – 18 = (£)106</i> <i>106 – 42 – 42 = (£22)</i> <i>B1</i> <i>(£) 22 is not enough for another day.</i> <i>E1</i>
6. (Number of tiles needed=) 6 × 2 × 8 × 2 192 (tiles) (Cost =) 192 × 2.5(0) (£)480	M1 A1 M1 A1	OR 8×6 ÷ (0.5×0.5) OR 8 ×6 ×4 FT 'their derived 192' ≠ 48 'Their 192' must be derived from consideration of dimensions of the room and of the tile. <i>If no marks, award SC1 for 48 × 2.50 = (£)120 (£)480 unsupported gains full marks.</i>

GCSE Mathematics – Numeracy Unit 2: Foundation Tier 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) $450 \times 99.4(0)$ 44 730 (rupees)	M1 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>
<p>8(b) $(450 \times 99.72 =) 44\ 874$ (rupees)</p> <p>Means he can buy 44 500 (rupees) or 89 (500 rupee notes)</p> <p>$44\ 500 \div 99.72$ or $450 - (44\ 874 - 44\ 500) \div 99.72$</p> <p>(£) 446.25</p>	<p>B1</p> <p>B1</p> <p>M1</p> <p>A1</p>	<p>B1 for sight of $(500 \div 99.72 =) (\text{£})5.01(40\dots)$</p> <p>OR B1 for sight of $44\ 874 \div 500 (=89.748\dots)$ AND $89 \times 500 = 44\ 500$ OR B1 for sight of $450 \div 5.01(40\dots) (=89.748\dots)$ AND $89 \times 500 = 44\ 500$ or 89 notes</p> <p>FT rounding down to nearest 500 rupees provided 450×99.72 attempted</p> <p>OR M1 for sight of $446.25 \times 99.72 = 44500$ from trial & improvement FT 'their 44 500' provided it is a multiple of 500 provided at least B1 previously awarded</p> <p>CAO</p> <p><i>Use of 99.40 rupees in (b)</i> $(450 \times 99.40 =) 44\ 730$ (rupees) B0 Means he can buy 44 500 (rupees) or 89 (500 rupee notes) B1 $44\ 500 \div 99.40$ or $450 - (44\ 730 - 44\ 500) \div 99.40$ M1 (£) 447.69 A0 as CAO</p>

GCSE Mathematics – Numeracy Unit 2: Foundation Tier Autumn 2016	Mark	Comment
9(a)(i) Angle $100^\circ (\pm 2^\circ)$ $36000 \times 100 (\pm 2) \div 360$ or $100 \times 100 (\pm 2)$ 9800 to 10200 (people)	B1 M1 A1	Sight of 100 ignoring any incorrect units is B1 only, until used in a relevant calculation FT for M1 only if the angle is out of tolerance but within $\pm 4^\circ$
9(a)(ii) (Talent show is) $\frac{1}{4}$ of 36000 and considering $\frac{2}{3}$ of this angle or number of people $\frac{2}{3} \times 36000 \times 90 \div 360$ or $\frac{2}{3} \times 9000$ or equivalent 6000 (women)	B1 M1 A1	OR considering 36000 – 'their drama' – 'their sport' – 'their news' if clearly identifiable Or $60 \times$ 'their number of people per degree' FT 'their $\frac{1}{4} \times 36000$ ' CAO
9(b) $360 \times 70/100$ or equivalent 252($^\circ$)	M1 A1	OR sight of $700 \div 2.7(777\dots)$ or $700 \div 2.8$ CAO

GCSE Mathematics – Numeracy Unit 2: Foundation Tier Autumn 2016	Mark	Comment																					
<p>10(a)</p> <p>(Eleri pays $6 \times \text{£}84.50 = \text{£}507$)</p> <p>(Nerys pays $\frac{2}{3} \times 6 \times 84.5(0)$ + 30 Amount in the range $\text{£}367.98$ to $\text{£}368.04$)</p> <p>(Nerys pays $\text{£}507 - (\text{£}367.98 \text{ to } 368.04)$ less than Eleri) An answer in the range $\text{£}138.96$ to $\text{£}139.02$</p>	<p>B1</p> <p>M1</p> <p>m1</p> <p>A1</p> <p>B1</p>	<p>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 (Note $\frac{1}{3} \times 84.50 = 28.1666\dots$) ($\frac{2}{3} \times 84.50 = 56.333\dots$)</p> <p>Or $6 \times 84.5(0) - \frac{1}{3} \times 6 \times 84.5(0)$ FT $\frac{2}{3} \times$ 'their $6 \times 84.5(0)$'</p> <p><i>(Reminder: Depends on both the M and the m mark awarded)</i></p> <p>FT provided attempt $6 \times \text{£}84.50$ for Eleri and M1 & m1 awarded for Nerys. <i>(Omitting the cost of the Railcard gives $\text{£}169$, B0)</i></p> <p><i>Treat single journey considered as</i> MR-1 <i>(Eleri pays $3 \times 84.50 = \text{£}253.50$)</i> B1 <i>(Nerys pays) $\frac{2}{3} \times \text{£}253.50$</i> M1 +30 m1 = $\text{£}198.99$ to $\text{£}199.02$ A1 <i>(difference of) $\text{£}54.48$ to $\text{£}54.51$</i> B1 <i>(depends on attempt 3×84.50 and M1, m1)</i></p> <p><i>AND also similar to the alternative shown below</i></p> <p><u>Alternative looking directly at the saving:</u> <i>(Nerys saves=) $\frac{1}{3} \times 6 \times (\text{£}84.50)$</i> M2 <i>$(\text{£}168.96 \text{ to } \text{£}169.02)$</i> A1 - 30 m1 <i>(FT 'their 169' - 30)</i> <i>$(=\text{£}138.96 \text{ to } \text{£}139.02)$</i> A1</p>																					
<p>10(b) $\frac{1}{3} \times 7(.)80$ $30 \div 2.60$</p> <p>He would need to make 12 (single) journeys (or more) or 6 return journeys (or more)</p>	<p>M1</p> <p>M1</p> <p>A1</p>	<p>FT 'their $\frac{1}{3} \times 7(.)80$' incorrectly evaluated Note: Break-even is 11.538 single journeys.</p> <p>CAO Allow 'if he goes (at least) once a month'</p> <p><i>Alternative:</i> <i>M1 for any one correct discounted return or single cost</i> <i>M1 for method for the equivalent of 12 single or 6 returns, full and discounted costs, with sight of considering also the $\text{£}30$</i> <i>A1 For either 6 return journeys or 12 singles, with no incorrect working seen</i></p> <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
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<p>11. Sight of (€) 7000 or (€) 24 000 or (€) 31 000</p> <p>(Tax at 25%) 0.25×7000</p> <p style="text-align: right;">(€) 1750</p> <p>(Tax at 35%) $0.35 \times 24\,000$ or $0.35 \times (34\,500 - 10\,500)$ or $0.35 \times (31\,000 - 7000)$ or equivalent</p> <p style="text-align: right;">(€) 8400</p> <p>Tax (€)10 150</p>	<p>B1</p> <p>M1</p> <p>A1</p> <p>M1</p> <p>A1</p> <p>B1</p>	<p>Ignore £ for €</p> <p>FT use of 'their 10500 - 3500', or 10500, or for sight of (€)2625 CAO, not FT</p> <p>FT use of $(31\,000 - 10\,500 =) 20\,500$ as 'their 24 000', including for sight of (€)7175</p> <p>CAO, not FT</p> <p>FT 'their 1750' + 'their 8400' provided both M1 marks previously awarded (e.g. FT 2625 + 7175 = (€)9800)</p> <p><u>Alternative:</u> Sight of (€) 7000, (€) 24000 or (€)31000 B1 $34500 -$ $(0.75 \times 7000 + 0.65 \times 24000 + 3500)$ M4 (or M1 for sight of $0.75 \times 7000 + 0.65 \times 24000 + 3500)$ (€) 10 150 A1</p>