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

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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. *Alternative:* *Number of days = (124 − 18) /42* *B1* *(=2·5238095…)* *The number of days must be a whole number so the number of days cannot be a decimal* *E1* *Alternative:* *124 – 18 = (£)106* *106 – 42 – 42 = (£22)* *B1* *(£) 22 is not enough for another day.* *E1*
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. *If no marks, award SC1 for 48 × 2.50 = (£)120* (£)480 unsupported gains full marks.

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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	Ignore additional incorrect statements except when it implies he was stopped 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' Allow, e.g. 'he was stuck in traffic he is still on his journey' 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'
8(a) 450 × 99.4(0) 44 730 (rupees)	M1 A1	If units are given they must be correct *If no marks, award SC1 for sight of digits 4473(0) irrespective of place value*
8(b) (450 × 99.72 =) 44 874 (rupees) Means he can buy 44 500 (rupees) or 89 (500 rupee notes) 44 500 ÷ 99.72 or 450 – (44 874 – 44 500) ÷ 99.72 (£) 446.25	B1 B1 M1 A1	B1 for sight of (500 ÷ 99.72 =) (£)5.01(40…) OR B1 for sight of 44 874 ÷ 500 (=89.748…) **AND** 89 × 500 = 44 500 OR B1 for sight of 450 ÷ 5.01(40…) (=89.748…) **AND** 89 × 500 = 44 500 or 89 notes FT rounding down to nearest 500 rupees provided 450 × 99.72 attempted OR M1 for sight of 446.25 × 99.72 = 44500 from trial & improvement FT 'their 44 500' provided it is a multiple of 500 provided at least B1 previously awarded CAO *<u>Use of 99.40 rupees in (b)</u> (450 × 99.40 =) 44 730 (rupees) B0 Means he can buy 44 500 (rupees) or B1 89 (500 rupee notes) 44 500 ÷ 99.40 or 450 – (44 730 – 44 500) ÷ 99.40 M1 (£) 447.69 A0 as CAO*

GCSE Mathematics – Numeracy Unit 2: Foundation Tier Autumn 2016	Mark	Comment
9(a)(i) Angle 100° (±2°)	B1	Sight of 100 ignoring any incorrect units is B1 only, until used in a relevant calculation
36000 × 100 (±2) ÷ 360 or 100 × 100 (±2)	M1	FT for M1 only if the angle is out of tolerance but within ±4°
9800 to 10200 (people)	A1	
9(a)(ii) (Talent show is) ¼ of 36000 **and** considering 2/3 of this angle or number of people	B1	OR considering 36000 – 'their drama' – 'their sport' – 'their news' if clearly identifiable
⅔ × 36000 × 90 ÷ 360 or ⅔ × 9000 or equivalent	M1	Or 60 × 'their number of people per degree' FT 'their ¼ × 36000'
6000 (women)	A1	CAO
9(b) 360 × 70/100 or equivalent	M1	OR sight of 700 ÷ 2.7(777…) or 700 ÷ 2.8
252(°)	A1	CAO

GCSE Mathematics – Numeracy Unit 2: Foundation Tier Autumn 2016	Mark	Comment
10(a)		Treat use of 0.333, 0.666 or 0.67 as PA-1, do not accept 0.3 or 0.6 as ⅓ or ⅔ respectively (Note ⅓ × 84.50 = 28.1666……) (⅔ × 84.50 = 56.333…..)
(Eleri pays 6 × £84.50 =) (£)507	B1	
(Nerys pays) ⅔ × 6 × 84.5(0)	M1	Or 6 × 84.5(0) − ⅓ × 6 × 84.5(0) FT ⅔ × 'their 6 × 84.5(0)'
+ 30	m1	
Amount in the range (£) 367.98 to (£)368.04	A1	*(Reminder: Depends on both the M and the m mark awarded)*
(Nerys pays £507 – (£367.98 to 368.04) less than Eleri) An answer in the range (£)138.96 to (£)139.02	B1	FT provided attempt 6 × £84.50 for Eleri and M1 & m1 awarded for Nerys. *(Omitting the cost of the Railcard gives £169, B0)* *Treat single journey considered as MR-1* *(Eleri pays 3 × 84.50 =) £253.50 B1* *(Nerys pays) ⅔×£253.50 M1* *+30 m1* *= (£)198.99 to (£)199.02 A1* *(difference of) (£)54.48 to (£)54.51 B1* *(depends on attempt 3 × 84.50 and M1, m1)* *AND also similar to the alternative shown below* *<u>Alternative looking directly at the saving:</u>* *(Nerys saves=) 1/3 × 6 × (£)84.50 M2* *(£)168.96 to (£)169.02 A1* *– 30 m1* *(FT 'their 169' – 30)* *(=£) 138.96 to (£)139.02 A1*
10(b) 1/3 × 7(.)80 30 ÷ 2.60	M1 M1	FT 'their 1/3 × 7(.)80' incorrectly evaluated Note: Break-even is 11.538 single journeys.
He would need to make 12 (single) journeys (or more) or 6 return journeys (or more)	A1	CAO Allow 'if he goes (at least) once a month' *Alternative:* *M1 for any one correct discounted return or single cost* *M1 for method for the equivalent of 12 single or 6 returns, full and discounted costs, with sight of considering also the £30* *A1 For either 6 return journeys or 12 singles, with no incorrect working seen*

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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11. Sight of (€) 7000 or (€) 24 000 or (€) 31 000	B1	Ignore £ for €
(Tax at 25%) 0.25× 7000	M1	FT use of 'their 10500 - 3500', or 10500, or for sight of (€)2625
(€) 1750	A1	CAO, not FT
(Tax at 35%) 0.35 × 24 000 or 0.35 × (34 500 – 10 500) or 0.35 × (31000 – 7000) or equivalent	M1	FT use of (31 000 – 10 500 =) 20 500 as 'their 24 000', including for sight of (€)7175
(€) 8400	A1	CAO, not FT
Tax (€)10 150	B1	FT 'their 1750' + 'their 8400' provided both M1 marks previously awarded (e.g. FT 2625 + 7175 = (€)9800)
		Alternative: *Sight of (€) 7000, (€) 24000 or (€)31000* *B1* *34500 -* *(0.75 × 7000 + 0.65 × 24000 + 3500)* *M4* *(or M1 for sight of* *0.75 × 7000 + 0.65 × 24000 + 3500)* *(€) 10 150* *A1*