



GCSE MARKING SCHEME

SUMMER 2018

**GCSE (NEW)
MATHEMATICS - NUMERACY
UNIT 2 - INTERMEDIATE TIER
3310U40-1**

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 (NEW)

SUMMER 2018 MARK SCHEME

GCSE Mathematics – Numeracy Unit 2: Intermediate Tier Summer 2018	Mark	Comment
1(a) 180	B1	
1(b) Angle measured $135^\circ \pm 2^\circ$ $\frac{2}{5} \times 135^\circ$ $= 54(^\circ)$	B1 M1 A1	FT for angles other than $135^\circ \pm 2^\circ$ provided $< 360^\circ$ Accept angles in the range $53(^\circ)$ to $55(^\circ)$
1(c) $720 - 0.45 \times 720$ or 0.55×720 396 (males)	M1 A1	For complete method If no marks, award SC1 for sight of 324 (females)
2(a) (Fresh water charge £) 25.25×1.08 $(= 27.27)$ (Waste water charge £) 22.31×1.70 $(= 37.927)$ (Total bill $£27.27 + £37.927 = £$) $65.19(7)$ or $65.2(0)$ Undercharged (by) $(£)6.4(0)$ or $(£)6.39(7)$	M1 M1 A1 B1	CAO Must state under charged and the amount, however accept $-(£)6.4(0)$ or $-(£)6.39(7)$ FT difference between ‘their derived total’ and $£58.80$ with appropriate conclusion, over or under charged
Organisation and communication	OC1	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
Writing	W1	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 terminology, units, etc.

4(a) 48 cm	B1	
4(b) 1:15 p.m. and 1:30 p.m	B1	
4(c) Suitable explanation, e.g. 'water level drops', 'depth of the water falls', 'depth is decreasing (during low tide)', 'depth of water is decreasing', 'water level decreased at night', 'tide goes down'	E1	Ignore any additional comments or values Must refer to 'water' or 'depth' Allow, e.g. 'when the water starts to run shallower' Do not accept, e.g. 'negative gradient', 'goes down', 'decrease going into the evening', 'depth of river is lower at this time', 'when the water starts to run shallow', 'river is dropping', 'it drops', 'it is decreasing', 'it goes down'
4(d) 1 hour	B1	

5(a) 24.25 suitcase symbols 9700 ÷ 24.25 (Represents) 400 (people)	B1 M1 A1	FT 'their 24.25' provided ≥ 23 Allow M1 for sight of any one of • $422 \times 23 = 9706$ • $404 \times 24 = 9696$ • $388 \times 25 = 9700$ 24.25 ÷ 9700 is M0, unless 400 seen FT provided 'their 400' is rounded to a whole number of people Do not allow an embedded answer with a multiplication <i>Unsupported 400 (people) is awarded all 3 marks</i> (Note: $9700 \div 23$ gives 421 or 422 people $9700 \div 23.25$ gives 417 or 418 people $9700 \div 23.75$ gives 408 or 409 people $9700 \div 24$ gives 404 or 405 people $9700 \div 25$ gives 388 people $9700 \div 26$ gives 373 or 374 people $9700 \div 27$ gives 359 or 360 people $9700 \div 28$ gives 346 or 347 people $9700 \div 29$ gives 334 or 335 people $9700 \div 30$ gives 323 or 324 people)
5(b) 3 : 2	B1	
5(c) Italy	B1	
5(d) $590 \times 0.6(0) \div 1.18$ or equivalent (£) 300	M3 A1	Ignore any additional incorrect calculations for M2 or M1 M2 for $590 \times 0.6(0)$ (= 354) or equivalent, or M1 for $590 \div 1.18$ (= 500) OR M1 for 590 – 'their 40% of 590' AND M1 for 'their 60%' ÷ 1.18 CAO. Accept an embedded answer, $300 \times 1.18 = 354$ An answer of (£)200, from $590 \times 0.4(0) \div 1.18$ is awarded M1 (for $590 \div 1.18$) and then SC1

6. Costs are (Helmet with discount £) $80 - 0.15 \times 80$ or 0.85×80 or equivalent	M1	(= £68) May be considered in stages
(Fuel, 1 month =£) $1.26 \times 350 \div 20$ or $0.06(3) \times 350$	M1	(=£22.05 or £21)
(Total of all costs $400 + 151.2(0) + 37 + 68 + 22.05$ or $588.20 + 68 + 22.05$)	M1	FT 'their £68' and 'their £22.05' (including use of £21)
(£)678.25	A1	CAO. OR from alternative method looking at months to save for each item sight of either 11 months and a further (£)18.25 to pay or 12 months and (£)41.75 left over (this method implies possible final m1 and/or A1)
(Need to save for) $678.25 \div 60$ (months)	m1	Award of m1 may be implied by A1 rounded up number of complete months FT 'their £678.25' provided at least M1 previously awarded (£677.20 $\div$ 60 leads to 11.2866....) Allow sight of repeated addition of £60, at least showing 11 lots of £60 (= £660) An answer of 11(.3... months) implies m1
12 (complete months)	A1	FT for 'their total cost' $\div$ 60 with the answer rounded up to whole number of months provided at least M1 previously awarded

7(a) (Period of time is) 3 years 4 months or 40 months Use of an amount between £16.8 and £22 million inclusive (£19.35 million being the mean of the values given in the question) (Amount given to charity per month is) An amount between (£)16.8 and (£)22 million inclusive divided by (number of months) 40 From correct calculation, an answer in the range (£)0.4 to (£)0.55 million inclusive or (£)400 000 to (£)550 000 inclusive	B1 M1 M1 A1	<u>No marks if no working shown</u> Accept 3 years 3 months 30 days or 3 years 3 months 29 days Ignore incorrect interpretation of 'million', including omission of 'million' Accept sight of an amount in this range used in any calculation FT from M1 FT 'their 40' provided it is within the inclusive range of 36 to 52 months Ignore incorrect interpretation of 'million', including omission of 'million' Do not accept omission of the word 'million' FT depends on M1, M1 previously awarded If working shown, this must be from correct calculation Ignore any additional rounding Accept a range given as an answer provided it falls within the answer range given Accept an answer rounded as an estimate, from working, provided it falls within the range given (FT within the inclusive range of 36 to 52 months gives an answer in the inclusive range £0.32 to £0.62 million)
7(b) Impact, e.g. 'more in September 2012 than in September 2014 as the number of 5p bags bought is falling over time', 'less given to good causes', 'decreases', 'less (given)'	E1	

8(a) (Rhodri's time is) $5.5/22$ $= 0.25$ (hours) or 15 mins Megan's time is 0.25 (hrs) – 5 mins (10 minutes or $\frac{1}{6}$ hour or $0.166\dots$ hour) (Megan's route is) $12 \times 10 \quad (\div 60)$ $= 2$ (miles)	M1 A1 M1 M1 A1	Use of 0.25 hours as 25 minutes is A0 otherwise if not used, ignore incorrect conversion to minutes For the idea, irrespective of inconsistent units FT 'their 0.25 hours' or 'their 15 minutes', including use of 0.25 hours, e.g. as 25 minutes FT 'their time used', written in hours or minutes provided at least M1 previously awarded CAO No marks for an unsupported answer of 2 (miles)
8(b) 66 (km/h)	B1	
9(a)(i) $(x^2 =) 3^2 + 12^2$ $x^2 = 153$ or $(x =) \sqrt{153}$ 12.4 (cm)	M1 A1 A2	Or alternative full method Or accurate first stage of alternative full method Must be 3 s.f. A1 for sight of $(x =) 12.40$ or $12.3(69\dots\text{cm})$, NOT for 12 (cm) FT from M1 for the correctly evaluated square root of 'their 153' provided 'their answer' > 12 (cm)
9(a)(ii) $(y =) \tan^{-1} 3/12$ or $\tan^{-1} 0.25$, or $\cos^{-1} 12/12.4$ or $\cos^{-1} 0.967\dots$ or $\cos^{-1} 0.97\dots$, or $\sin^{-1} 3/12.4$ or $\sin^{-1} 0.24\dots$, $(y =) 14.(0\dots^\circ)$ (which is < 15°)	M2 A1	FT 'their 12.4' provided > 12 (cm) M1 for $\tan y = 3/12$ or $\cos y = 12/12.4$ or $\sin y = 3/12.4$ Accept $14.(59\dots^\circ)$ from use of 12.4 cm
9(b) $12 \times 4.5 \div 3$ or $4.5/\tan 14.(0\dots^\circ)$ 18(cm) or 18.0(... cm)	M1 A1	FT 'their angle y' ISW to calculate the hypotenuse
10(a) $(2 \times) 65 \times 5$ 650 (m²)	M1 A1	
10(b) (Area of both ends) $\pi \times 20^2 - \pi \times 15^2$ or equivalent (=549.7.....) + 650 An answer in the range 1199 (m²) to 1200 (m²)	M2 m1 A1	(= $1256.(...) - 706.(...)$) M1 for $\frac{1}{2} \times \pi \times 20^2 - \frac{1}{2} \times \pi \times 15^2$ or $2 \times \pi \times 20^2 - 2 \times \pi \times 15^2$ FT adding 'their (a)' FT provided at least M1 previously awarded Accept $175\pi + 650$ (m²) FT from M2, m1 previously awarded
10(c) Area $\times (0.)20 \div 3$ £80	M1 A1	FT 'their area' from 10(b) Must be correct to the nearest £ An answer of 8000 implies M1, A0

11. $C = \frac{300 \times (60 - 32)}{32 - 8}$ $= 350$ (litres) $T = \frac{350 + 300}{26}$ $= 25$ (minutes)	M2 A1 M1 A1	M1 for any 3 or 4 values substituted correctly CAO FT 'their derived 350' and 'their 300' (used as H) If no marks, award SC1 for all 5 of the following correctly matched, i.e. H = 300, M = 32, X = 60, Y = 8, F = 26
12(a) Midpoints 20.5, 21.5, 22.5, 23.5 Missing 10 days for $23 \leq t < 24$ $20.5 \times 4 + 21.5 \times 8 + 22.5 \times 8 + 23.5 \times 10$ (= 82 + 172 + 180 + 235 = 669) $\div 30$ 22.3(°C)	B1 B1 M1 m1 A1	FT 'their 10' provided $\neq 0$ Allow with incorrect midpoints provided each one is within the correct interval including 'bounds' FT 20 + 'their 10' Allow 22(°C) from correct working If no marks or first B1 only, award SC1 for an answer of 21.7 (°C) (from working with the 20 days given)
12(b) Suitable assumption stated, e.g. 'used the midpoints (to represent each group)', 'I used a value in each of the groups to represent the group', 'the temperature is between the 2 values each time'	E1	FT from 'their points' used in (a)
12(c) Suitable reason given, e.g. 'many of the temperatures were less than the midpoint of the group in which they were recorded', 'the temperatures were often towards the lower end of the groups'	E1	Do not accept e.g. 'mid points were used', 'Faryl used exact values', 'raw data was used by Faryl', 'Faryl found the actual mean' without further explanation