GCSE MARKING SCHEME

AUTUMN 2020

GCSE
MATHEMATICS – COMPONENT 2
(FOUNDATION TIER)
C300U20-1

INTRODUCTION

This marking scheme was used by WJEC for the 2020 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.

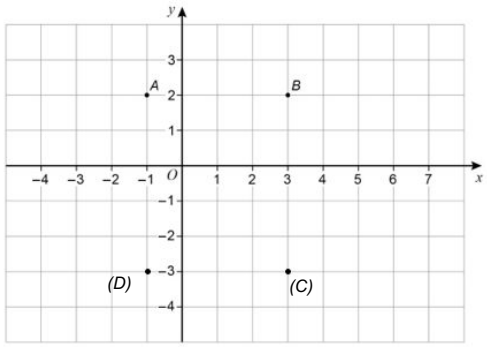
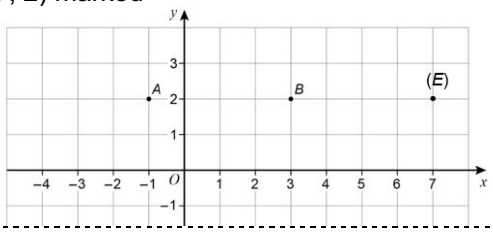
It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.

EDUQAS GCSE MATHEMATICS

AUTUMN 2020 MARK SCHEME

GCSE (9-1) Mathematics **Component 2: Foundation Tier**	**Mark**	**Comment**
1.(a) 108	B1	
1.(b) 29	B1	
1.(c) 18	B1	
1.(d) 343	B1	
	(4)	
2. (a) (34 × 6) ÷ 8 = 25.5	M1 A1	May be seen in stages. If no marks, award SC1 for sight of 204.
2.(b) (80 – 14) ÷ 5.75 11	M2 A1	May be implied by 14 + 5.75 × 11 = 77.25 from trials M1 for a correct trial of 14 + 5.75 × *n* where *n* > 1 or M1 for 80 – 14 CAO An answer or 11.4(7…) or 11.5 implies M2 A0. 14 + 5.75 × 11 = 77.25 gains M2 A0 unless 11 days is indicated as their answer.
	(5)	
3.(a)(i) (2.74 + 0.62) × 4 (£)13.44 or 1344(p)	M2 A1	May be in pence but units must be consistent M1 for sight of any one of • 4 × 2.74 (=10.96) • 4 × 0.62 (=2.48) • 2.74 + 0.62 (=3.36) If units are given, they must be correct. Allow £13.44p If no marks, award SC2 for an answer of (£)10.08 or SC1 for (2.74 + 0.62) × 3
3.(a)(ii) (£)6.56 or 656(p)	B1	FT 'their (£)13.44' If units are given, they must be correct. Allow £6.56p
3.(b) 2.74 + 0.62 + 1.15 – 3.79 (£)0.72 or 72(p)	M1 A1	May be in pence but units must be consistent FT 'their 3.36' + 1.15 – 3.79 If units are given, they must be correct. Allow £0.72p
	(6)	
4.(a)(i) 	B1	
4.(a)(ii) 7	B1	
4.(a)(iii) 98	B1	

4.(b) (Number of triangles =) 2 × number of squares oe	B1	ISW Allow e.g. '2 × squares' 'double the number of squares' 'squares doubled' ' S x 2' Do not allow e.g. '× 2' '2 × pattern number' 'for each square there are two triangles' 'one square and two triangles' 'the triangles go up in two's the square's go up in one's'
	(4)	
5.(a) (x =) 180 – 40 – 77 63(°)	M1 A1	
5.(b) (y =) 180 - 90 – 32 58(°)	M1 A1	
	(4)	
6.(a) (–1, –3) and (3, –3) marked  	B2	B1 for two points that make a rectangle Ignore not labelled or incorrectly labelled points if the marked points are unambiguous.
6.(b)(i) (7, 2) marked  	B1	
6.(b)(ii) (7, 2)	B1	FT 'their *E*'
	(4)	
7.(a) (22 – –14) ÷ 4 or 9 or equivalent 17(:)00 or 5 p.m.	M1 A1	Allow repeated subtraction of 4 nine times with one arithmetic error An answer of 5 a.m. or 5 o'clock implies M1A0
7.(b) 7 (°F)	B1	Allow 6.5 to 7.5 inclusive.
	(3)	

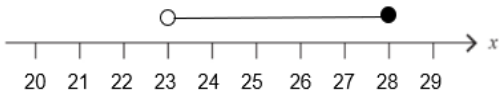
8.(a) $\frac{1}{500}$ oe	B1	ISW Do not accept incorrect notation e.g '1 out of 500'
8.(b) $\frac{300}{500}$ or 0.6 oe	B1	ISW Do not accept incorrect notation e.g '300 out of 500' NOTE: If no marks awarded in (a) or (b) award SC1 for consistent incorrect notation e.g '1 out of 500' AND '300 out of 500'.
8.(c) No and a correct explanation e.g. 'The probability is $\frac{8}{500}$ (so less than 50%)' 'He has less than half the tickets so less than 50% chance.' 'He would have to buy 250 tickets to have a 50% chance of winning.'	E1	Allow e.g. 'Ben winning and losing are not equally likely.' 'He will have an 8 in 500 chance of winning.' 'He needs more tickets to have a 50% chance.' 'He hasn't bought 50% of the tickets.' Do not allow e.g. 'Winning and losing are not equally likely.' 'he only has 8 out of 500 tickets'
8.(d)(i) 0.99 oe	B1	
8.(d)(ii) 0.01 × 500 or 500 – (0.99 × 500) = 5 (tickets)	M1 A1	Accept $\left(\frac{1}{100} = \right) \frac{5}{500}$ for M1
	(6)	
9. 58.5 – 1.8 × 12.5(0) (= 36) 36 ÷ 3.2 = (£)11.25 or 36 ÷ 11.25 = 3.2(m) or 3.2 × 11.25 = (£)36	M2 A1	M1 for 1.8 × 12.5(0) (= 22.50) Convincing correct final step Dependent on M2
Alternative method 1 *1.8 × 12.5(0) + 3.2 × 11.25* *36 + 22.5(0) = (£)58.5(0)*	*M2* *A1*	*M1 for either 1.8 × 12.5(0) (=22.50) or for 3.2 × 11.25 (= 36)* *Convincing correct final step*
Alternative method 2 *1.8 x 12.5 + 3.2y = 58.50* *3.2y = 58.50 - 22.5. or 3.2y = 36* *(y) 36 ÷ 3.2 = (£) 11.25*	*M1* *M1* *A1*	*Allow other notation*
	(3)	

10. (a) CC CV CS SS SV VV oe	B2	B1 for 4 or 5 correct Ignore inclusion of VC, SC and VS oe
10.(b) 1300 × 2 ÷ 125 × 43.5(0) (21 × 43.50 =) (£)913.5(0)	 M1 M1 M1 A2	 Method marks may be awarded in any order (= 2600) (= 20.8) CAO Award M3 A1 for (£)904.8(0) (from 20.8 × 43.50) Award M2 SC2 for (£)478.5(0) (from 11 × 43.50) Award M2 SC1 for (£)452.4(0) (from 10.4×43.50)
Alternative method finding t, the number of tubs using trial(s) *Use of trial(s) of* *125 × t OR 125 ÷ 2 × t where t > 8* *t=21 from correct calculations in relevant trial(s) seen* *125 × 20 = 2500, 125 × 21 = 2625,* *OR* *62.5 × 20 = 1250, 0R 62.5 × 21 = 1312.5* *Calculating the cost* *21 × 43.5(0) =* *(£)913.5(0)*	 *M1* *A2* *M1* *A1*	 *A1 if t = 21 but an error in the relevant calculation(s) seen* *If M1 A0 award SC1 for t = 11 with no errors in relevant calculation(s) seen* *125 × 10 = 1250, 125 × 11 = 1375* *FT 'their t' for M1 only* *CAO* *If M1 A0 award SC1 for (£)478.5(0) (from 11 × 43.50)* *Award M1 A1 M1 A1 for (£)904.8(0) (from trial(s) with an error)* *Award M1 SC1 M1 SC1 for (£)478.5(0) (from trial(s) with no error)* *Award M1 SC0 M1 SC1 for (£)478.5(0) (from trial(s) with an error)*
	(7)	
11.(a) 6500 – (12.5 × 6500) ÷ 100 or 6500 × (100 – 12.5) ÷ 100 oe (£) 5687.5(0)	M2 A1	M1 for (12.5 × 6500) ÷ 100 oe or (£)812.5(0) If a partitioning method is used to find 12.5%, it must be a fully correct method.
11.(b) 875 × 0.06 × 3 oe (£)157.5(0)	 M1 A1	May be seen in stages. ISW If no marks, award SC1 for a sight of (£)52.5(0) OR SC1 for a final answer of (£)1032.5(0)
11.(c) 200(%)	B1	
	(6)	

12. (a)(i) <table><tr><td></td><td>Barry</td><td>Samira</td></tr><tr><td>**Range**</td><td>48</td><td>**42**</td></tr><tr><td>**Median**</td><td>**185**</td><td>183</td></tr></table>	B2	B1 for one correct
12.(a)(ii) Samira because range is smaller	B1	FT their table Allow e.g 'Samira as her distances are less spread out (than Barry)' 'Samira as the numbers are closer together' Do not allow e.g 'Samira, her miles are more consistent'
12.(b)(i) 3405 × 12 or 40 000 ÷ 12 40 860 (>40 000) or 3333(.33…) (< 3405)	M1 A1	Accept 3400 × 12 Allow equivalent calculations using distance per day. Accept 40 800 Allow 40 900 and 41 000 from correct working.
12.(b)(ii) Relevant assumption e.g. 'She has assumed that the month was typical.' Or 'She has assumed that she will drive the same distance each month' Correct effect of assumption e.g. 'If other months were busier, she would drive further.'	E1 E1	Do not accept 'there are 12 months in a year' Dependent on the assumption mark being awarded. Allow both the assumption and explanation written here.
	(7)	
13.(a) 2 × 2 × 5 or 1 × 4 × 5 or 1 × 2 × 10 or 1 × 1 × 20 oe	B1	Accept any clear representation of correct dimensions
13.(b) Correct explanation Eg 'she needs to ÷ 6 first' ' she has done things in the wrong order' 'you need to square root the area of a face' '144 ÷ 6 first'	B1	Do not allow e.g '÷ 6' '144 ÷ 6'
	(2)	

14.(a) $30 \div 1.6$ 18.75 (miles per second)	 M1 A1	 Do not ISW but award M1A0 if $30 \div 1.6$ or 18.75 are seen with further incorrect work.
14.(b)(i) 1.6×1.6 or 1.6^2 2.56 (km^2)	 M1 A1	
14.(b)(ii) 512 million or 512 000 000	 B2	 FT their answer to (b)(i) and award: B2 for the correct evaluation of 200 000 000 × 'their 2.56' *For example, with an answer of 4 in (i) award B2 for 800 000 000 or 800 million* B1 for the correct evaluation of 20 000 000 × 'their 2.56' OR 2 000 000 000 × 'their 2.56' (a place value error of a power of 10 only)
	(6)	

15. 4.8 ± 0.2 4.8 × 50 = (240) 240 ÷ 5.75 or (240 ÷ 345) × 60 41.7(39…) to 42 (mph)	 B1 M1 M2 A1	 May be implied by [230, 250] (miles) FT 'their 4.8' FT 'their 240' Allow M1 for 'their 240' ÷ 'time' where 'their time' is an attempt at the time from 06:00 to 11:45 however expressed e.g 5.45 FT provided the previous M2 awarded Answers for use of 4.6 to 5(cm) Length 4.6 4.7 4.8 4.9 5.0 Speed 40 40.86.. 41.73.. 42.60.. 43.47..
	(5)	
16.(a) (100 ×) 44 ÷ 135 =0.325(…) or 0.326 or 0.33 OR 32.5(…) or 32.6 or 33 (%) A greater proportion of women than men completed the survey.	 M1 A1 E1	 Depends on M1 previously awarded. FT their answer for appropriate statement indicated or unambiguously implied If no marks award SC1 for sight of 48(men)
Alternative method *0.32 × 135* *= 43.2(women)* *A greater proportion of women than men completed the survey.*	 *M1* *A1* *E1*	 *Depends on M1 previously awarded.* *FT their answer for appropriate statement indicated or unambiguously implied*
16.(b) 0.4 × 0.2 × 225 oe 18	 M2 A1	 M1 for 225 × 0.4 or 90 OR 0.4 × 0.2 or 0.08 oe CAO
	(6)	
17. Method of comparison e.g. per 25ml, ml per penny or similar Correctly evaluated calculations for at least two of the three sizes AND appropriate conclusion OR Correctly evaluated calculations that should enable comparison of all three. Correctly evaluated comparison of all three sizes, may be different comparisons at different stages AND correct conclusion "large bottle is best value for money"	 M1 A1 A1	 Needs to show attempt to compare at least two of the three Ignore incorrect units 3000 ml 25 ml 100 ml per p ml per £ 200 ml £14.70 12.25p 49p 2.04.. ml 204(.0..) ml 375 ml £14.40 12p 48p 2.08.. ml 208(.3..) ml 500 ml £13.80 11.5p 46p 2.17.. ml 217(.3..) ml Consistent units that are not obviously incorrect are required or allow no units given. Comparison of small/med and med/large is comparison of all three. Comparison of small/med and small/large is not a comparison of all three.
	(3)	
18.(a) 366 ÷ (1+3) × 3 (£)274.5(0)	 M1 A1	 If M0 award SC1 for sight of (£)91.5(0)
18.(b) 3 : 5	 B2	 B1 for an answer of 6 : 10 oe SC1 for an answer of 3 : 2, (from halving not doubling and obtaining 6 : 4) or a final answer of 5 : 3
	(4)	

19.(a) –2, –1, 0, 1, 2	B2	B1 –2 $\leq n <$ 3 or –2, –1, 0, 1, 2, 3 or –1, 0, 1, 2 or –4, –3, –2, –1, 0, 1, 2, 3, 4, 5 or -2 -1 1 2
19.(b) A straight line with an empty circle at 23 and a solid circle at 28.  	B2	B1 for a line joining two circles in the correct position but incorrectly shaded. B1 for a correct circle at one end and a line going from it in the correct direction.
	(4)	
20*. (Interior angle of the heptagon =) 180 – 360 ÷ 7 OR (7 – 2) × 180 ÷ 7 OR (7 × 180 – 360) ÷ 7 =128.6(°) or 128.57(…)(°) (Unique angle in triangle =) (360 – 90 – 90 – 128.6 =) 51.4(28…°) Working to show that x = 64.3 to 1 d.p. (180 – 51.4(28…)) ÷ 2 = 64.285 to 64.3	 M1 A1 B1 B1	 May be seen on diagram. FT 'their derived 128.6' May be seen on diagram. CAO
Alternative method 1 working from 64.3 *(Unique angle in triangle =)* *(180 – 64.3 – 64.3) = 51.4* *(Interior angle of the heptagon =)* *(360 - 90 - 90 - 51.4) =128.6* *(Interior angle of the heptagon =)* *180 – (360 ÷ 7)* *OR (7 – 2) × 180 ÷ 7* *OR (7 × 180 – 360) ÷ 7* *=128.6(°) or 128.57(…)(°)*	 *B1* *B1* *M1* *A1*	 *FT 'their 180 – 64.3 – 64.3'* *Only awarded if this is clearly the interior angle of the heptagon*
Alternative method 1a for final 2 marks *(Sum of the interior angles of a heptagon=)* *(7 – 2) × 180 o.e* *AND 128.6 × 7*	*M1*	*M0 for 'their 128.6 × 7' = 900(.2) alone*
900	*A1*	*Allow for 900 and 900.2*
Alternative method 2 using exterior angles *Exterior angle (of the heptagon) =* *360 ÷ 7* *= 51.4(28…°)*	 *M1* *A1*	 *Method must be seen*
(Unique angle in triangle =) *(360 – 90 – 90 – (180 - 51.4(28…°)))* *= 51.4(28…°)*	*B1*	*May be seen on diagram.* *FT 'their derived 51.4(28…)*
Working to show that *(x =) (180 – 51.4(28…))÷ 2 = 64.3*	*B1*	*May be seen on diagram.* *CAO*
	(4)	

21.* (1 – 0.8(0)) × 40 OR 40 – 0.8(0) × 40 OR (0.15 + 0.05) × 40 OR 0.15 × 40 + 0.05 × 40 8	M2 A1	M1 for sight of one of the following: • 1 – 0.8(0) • 0.15 + 0.05 • 0.2(0) • 0.8(0) × 40 • 32 • 0.15 × 40 • 0.05 × 40 CAO
	(3)	
22.* $(h =) \frac{500}{\pi \times 3.5^2} = 500/38.4(8..)$ (h =) 12.98(…) to 13 (cm)	M2 A1	M1 for $500 = \pi \times 3.5^2 \times h$ CAO not from incorrect working If no marks award SC1 for an answer of: 25.97 to 26(.0) from $500 = \frac{1}{2}\pi \times 3.5^2 \times h$ OR 38.96 to 39(.0) from $500 = \frac{1}{3}\pi \times 3.5^2 \times h$
	(3)	
23.(a)(i) Any valid reason e.g. '10 years is too far ahead to predict.' 'the paper might not be produced if sales continue to fall' 'the change each time is not consistent.'	B1	If a satisfactory reason is given ignore further spurious comments. Allow e.g. 'because the sales may not follow the pattern of the graph.' 'there is not an equal; drop in numbers sold every 5 years' 'it's too far in the future, we can't tell' 'it could increase instead of decrease' 'more people may read the paper on the internet' Do not allow statements that do not relate to the graph e.g. 'there might be more or less than 10 000 sold in 2025' as no reference to the trend 'we can't tell' as no reference to time or trend
(a)(ii) $(100 \times) \frac{62(000)-26(000)}{62(000)}$ OR $(100 \times)0.58(\ldots)$ or $(100 \times)(1 - \frac{26(000)}{62(000)})$ OR (100 ×) (1 – 0.419) or (100 ×) (1 – 0.42) 58(.06…%) or 58.1(%)	M1 A1	If no marks award SC1 for an answer of 41.9(3…%), allow 42(%) from evaluation of 26000/62000 × 100 but not from trials.
(b) 52000000 ÷ (16 + 9) × 16 33 280 000	M1 A1	Allow a place value slip in 52 000 000 for M1 only Allow 33 000 000 and 33 300 000
	(5)	

24.* $5x + 40 = 6x + 20$ $x = 20$ $5 \times 20 + 40 + y + 35 = 180$ OR $6 \times 20 + 20 + y + 35 = 180$ OR $5 \times 20 + 40 + 2(y + 35) + 6 \times 20 + 20 = 360$ $y = 5$	 M1 A1 M2 A1	 Allow for $5 \times 20 + 40 = 6 \times 20 + 20$ which may be seen in stages FT 'their 20' for possible M2 provided previous M1 awarded. May be seen in stages. M1 for a correct equation $5x + 40 + y + 35 = 180$ or $6x + 20 + y + 35 = 180$ or $5x + 40 + y + 35 + 6x + 20 + y + 35 = 360$ CAO
24. Alternative method (using simultaneous equations)* *Writes two correct equations in x and y* *$5x + 40 + y + 35 = 180$* *or $6x + 20 + y + 35 = 180$* *or $5x + 40 + y + 35 + 6x + 20 + y + 35 = 360$* *Method to eliminate variable, e.g. equal coefficients and method to find second variable* *Finds the value of the first variable* *Second variable*	 *M2* *m1* *A1* *A1*	 *M1 for each correct equation* *May be simplified* *Allow one error in one term but not with equal coefficients* *CAO* *$x = 20$ OR $y = 5$* *FT 'their first variable'*
	(5)	
25.* Correct perpendicular bisector construction with appropriate arcs Correct angle bisector construction of *XOY* with appropriate arcs Correct point indicated	 B2 B2 B1	 B1 for perpendicular bisector within tolerance ($\pm 2°$) without arcs or with invalid arcs or for a correct pair of arcs that intersect twice. B1 for angle bisector within tolerance ($\pm 2°$) without arcs or with invalid arcs or for a correct pair of arcs FT provided at least B1, B1 awarded; may be implied by intersecting loci
	(5)	
26.*(a) $(x^2 =)\ 11.3^2 - 8.6^2$ $x^2 = 53.73$ or $(x =) \sqrt{53.73}$ $(x =)$ 7.3(3… cm)	 M1 A1 A1	 FT from M1 for the correctly evaluated square root of 'their 53.73' provided $x < 11.3$ If no marks, award SC2 for an answer of $7.3(3…\text{cm})$ seen from use of $8.6^2 - 11.3^2$
(b) $\cos(y) = 8.6 \div 13.5$ $(y =)\ \cos^{-1}(8.6 \div 13.5)$ $(y =)$ 50(.4…..°)	 M1 m1 A1	 Accept any equivalent full method
	(6)	