GCSE MARKING SCHEME

SUMMER 2025

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

About this marking scheme

The purpose of this marking scheme is to provide teachers, learners, and other interested parties, with an understanding of the assessment criteria used to assess this specific assessment.

This marking scheme reflects the criteria by which this assessment was marked in a live series and was finalised following detailed discussion at an examiners' conference. A team of qualified examiners were trained specifically in the application of this marking scheme. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners. It may not be possible, or appropriate, to capture every variation that a candidate may present in their responses within this marking scheme. However, during the training conference, examiners were guided in using their professional judgement to credit alternative valid responses as instructed by the document, and through reviewing exemplar responses.

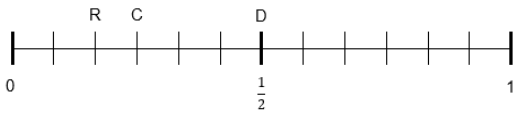
Without the benefit of participation in the examiners' conference, teachers, learners and other users, may have different views on certain matters of detail or interpretation. Therefore, it is strongly recommended that this marking scheme is used alongside other guidance, such as published exemplar materials or Guidance for Teaching. This marking scheme is final and will not be changed, unless in the event that a clear error is identified, as it reflects the criteria used to assess candidate responses during the live series.

EDUQAS GCSE MATHEMATICS

SUMMER 2025 MARK SCHEME

GCSE (9-1) Mathematics Component 2: Foundation Tier	Mark	
1.(a) 12 300 000	B1	
1.(b) 2.07 2.174 2.45 2.6	B1	
1.(c) Any 4 small triangles shaded	B1	
1.(d) -9 < -12 circled or unambiguously indicated	B1	
	(4)	
2.(a) (£)15.34 or 1534(p)	B1	Note: Allow £15.34p but not 15.34p or £1534
2.(b) 13.23 ÷ 1.89 oe = 7	M1 A1	
2.(c) Yes, indicated or implied with a valid reason e.g. '(She will save) (£)7.6(0) (by paying monthly).' '(It comes to) (£)47.6(0) (so she will save money).' '(Her classes cost her) (£)571.2(0) (a year and membership would be) (£)480 (a year).'	B2	B1 one of the following: • 3 × 6.70 + 4 × 4.75 + 2 × 4.25 oe (20.1 + 19 + 8.5 = 47.6) • (£)7.6(0) without 'Yes' indicated or implied • (£)47.6(0) without 'Yes' indicated or implied • (comparing annual costs) (3 × 6.70 + 4 × 4.75 + 2 × 4.25) × 12 oe (= 571.2(0)) AND 40 × 12 (= 480) without 'Yes' indicated or implied If no marks, award SC1 for a calculation for the three classes with a slip in one value, either in reading from the table or the number of classes, AND a correct FT conclusion.
	(5)	

3.(a) E B A and F	 B1 B1 B1	 In any order
3.(b)(i) (x =) (180 – 90) ÷ 2 = 45(°)	 M1 A1	Angle may be seen on the diagram. May be seen in stages
3.(b)(ii) (y =) 22(°)	 B1	
	(6)	

4.(a) (4, 1)	B1	
4.(b) An unambiguous cross marked at (1,3)	B1	
4.(c) 540 (m)	B2	Allow answers in the range 522 to 558 from use of 6 ± 2mm B1 for one of the following: • 2 × 6 × 45. Allow for use of 6 ± 2mm. • Appropriate sight of (6 × 45 =) 270(m). Allow for answers in the range 261 to 279 from use of 6 ± 2mm. • 540 (m) seen and then spoiled by an attempt at unit conversion If no marks, award SC1 for one of the following: • a correct evaluation of 2 × 'their 6' × 45 where 'their 6' is clearly identified • 630 (m) (from 2 × 7 × 45 counting the intersections) • 450 (m) (from 2 × 5 × 45)
	(4)	
5.(a) $\frac{1}{12}$	B2	B1 for $\frac{30}{360}$ or equivalent fraction that has not been fully simplified or has been simplified incorrectly. Allow B1 for 1 out of 12 or 1:12.
5.(b) D correctly placed C correctly placed R correctly placed  	B1 B1 B1	FT 2 × 'their (a)'
	(5)	

6. 14(cm) AND 3(cm)	B2	Answer lines take precedence for B2. Allow in any order. B1 for one of the following: • A length and width, unambiguously selected as their answer, that give an area of 42 cm^2 • A length and width, unambiguously selected as their answer, that give a perimeter of 34 cm • L × W = 42 AND L + W = 17 or 2L + 2W = 34 oe Allow B1 for • a length and width both = $\sqrt{42}$ (= 6.48(0..)) (area of 42) • length and width both = 8.5 (perimeter of 34)
	(2)	
7. 17 AND 23	B2	Answer lines take precedence. In any order. B1 for one of the following as a final answer: • 3 AND 37 • 11 AND 29 (two prime numbers with a sum of 40) • 13 AND 27 • 19 AND 21 (two numbers with a sum of 40 where only one of them is prime and both are greater than 12). • Two different prime numbers greater than 12 If no marks, award SC1 for a list of all the prime numbers between 12 and 40 (13, 17, 19, 23, 29, 31, 37) with no other numbers between 12 and 40. Ignore any other values outside of the range 12 to 40.
	(2)	

8. (Pencil =) (£)0.64 or 64(p) (Protractor) (4.39 – 0.64) ÷ 3 (= 3.75 ÷ 3) or (439 – 64) ÷ 3 (= 375 ÷ 3) = (£)1.25 = 125(p) (Pencil sharpener) (5.38 – 2 × 1.25) ÷ 3 (= (5.38 – 2.50) ÷ 3) (= 2.88 ÷ 3) or (538 – 2 × 125) ÷ 3 (= (538 – 250) ÷ 3) (= 288 ÷ 3) = (£)0.96 = 96(p)	B1 M1 A1 M1 A1	Penalise once only for incorrect units Table takes precedence. Allow £0.64p FT 'their (£)0.64 or 64(p)' Allow FT answers rounded or truncated to the nearest penny FT 'their (£)1.25 or 125(p)' provided > 0 Allow FT answers rounded or truncated to the nearest penny
	(5)	
9.(a) 3 × 7 + 2.5 × 8 – 9 (= 21 + 20 – 9) = 32 (points)	M1 A1	May be seen in stages
9.(b) (48 – 6 × 3) ÷ 2.5 oe (= 30 ÷ 2.5) = 12 (matches)	M2 A1	May be seen in stages M1 for 48 – 6 × 3 (= 30) CAO Allow an embedded answer provided it is not contradicted.
	(5)	
10.(a) -8 (°C)	B1	
10.(b) -6.5 or $-6\frac{1}{2}$ or $\frac{-13}{2}$ (°C)	B2	B1 for either of the following: • identifying -8 and -5 • -13 ÷ 2 If no marks, award SC1 for an answer of 6.5
10.(c) -7(°C)	B2	B1 for either of: • -6 × 7 (= -42) • $\frac{-9-8-4-5-1-8+x}{7} = -6$ or better
	(5)	

11.(a) -3 AND 0 correctly placed	B2	Allow B2 for -3 AND -0 B1 for one of the following: • -3 correctly placed • 0 correctly placed • 'their -3' + 3 correctly evaluated provided 'their -3' is negative.
11.(b) 10y – 21	B2	Mark final answer. B1 for one of the following: • 10y + a where a ≠ 0 • by – 21 where b ≠ 0 • -6y – 21 expanding bracket correctly • 10y – 21 seen then spoiled If no marks, award SC1 for an answer of $10y^2 - 21$
11.(c) 3(4w – 3)	B1	Allow 3 × (4w – 3) or (4w – 3)3 or (4w – 3) × 3 Mark final answer.
11.(d) 5x = 11 x = 2.2 or $\frac{11}{5}$ or $2\frac{1}{5}$ ISW	B1 B1	FT equation in the form 5x = a where a ≠ 14. Note: If on FT the answer is an integer it should be given as an integer. Allow embedded answer. Note: An answer of 2.2 or $\frac{11}{5}$ or $2\frac{1}{5}$ is awarded B1 B1. If no marks, award SC1 for (x =) (14 - 3) ÷ 5 not 14 - 3 ÷ 5
11.(e) A correct explanation e.g. 'It should be cubed (not multiplied by three).' '(The middle line) should be (y =) 5^3.' 'It should be 5 × 5 × 5 (not 5 × 3).' '5^3 means multiply 5 by itself three times (not multiply by 3).'	E1	Allow e.g. 'The opposite of cube root is not to multiply by 3.' 'The power of three does not mean multiply by 3.' 'She multiplied by 3 but she should have cubed.' '$5^3 = 5 \times 5 \times 5$.' 'y is 125 (not 15).' '$\sqrt[3]{15} \neq 5$' '$\sqrt[3]{15}$ = 2.46…or 2.47' '$\sqrt[3]{125} = 5$.' Do not allow e.g. 'She multiplied by 3.' 'She thinks it is a divide by 3.'
	(8)	

12.(a) 0.37 × 650 oe = 240.5 or $240\frac{1}{2}$ or $\frac{481}{2}$	M1 A1	 Mark final answer but allow the A1 for a final answer of 241 if 240.5 oe previously seen. Otherwise, an answer of 241(supported or unsupported) is awarded M1 A0 provided it is not from incorrect work. 240.5% is awarded M1 A0. If no marks, award SC1 for and answer of: • 409.5 (650 × 0.63) (supported or unsupported) • 890.5 (650 × 1.37) (supported or unsupported)
12.(b) ($\frac{2}{9}$ of 477 =) 477 ÷ 9 × 2 or $\frac{2}{9}$ × 477 oe = 106 (477 + 477 ÷ 9 × 2 = 477 + 106 =) 583 (mm)	M1 A1 B1	Answer line takes precedence. FT 477 + 'their 106' provided M1 awarded
Alternative method *477 ÷ 9 × (9 + 2) or* $\frac{9+2}{9}$ × *477 oe* *= 583 (mm)*	*M2* *A1*	*M1 for* $\frac{9+2}{9}$ *or sight of* $\frac{11}{9}$ *or equivalent fractions.*
12.(c) $\frac{54}{171}$ (× 100) or 54 ÷ 171 (× 100) = 31.6(%)	M1 A2	Note: Allow M1 for sight of 0.315(7…) A1 for 31.5(7…..) or 31.58 Allow A1 for an answer of 32(%) provided it is from correct working. If trials are used: Award SC2 for an answer of 31.6% (from 31.6% of 171 = 54.036) SC1 for an answer of 31.5% (from 31.5% of 171 = 53.865)
	(8)	

13.(a) 450 × 1.5 or 450 + 450 ÷ 2 or 450 ÷ 8 × 12 = 675(g)	 M1 A1	 Or equivalent. May be seen in stages. Allow equivalent work in kg for M1, but the answer must be given in grams for A1.
13.(b) 1650 ÷ 275 or 1.65 ÷ 0.275 oe = 6 (pies)	 M2 A1	 May be seen as a build-up method. M1 for the correct division with an incorrect conversion or no conversion e.g. 1.65 ÷ 275 (any power of 10 multiplication or division) CAO. Mark final answer. Allow 48 servings if 6 pies is seen. Allow an embedded answer of 6 provided it is not contradicted e.g. Award M2 A0 for 1650 = 275 × 6 followed by 48 (if 6 is seen) or 1650 ÷ 275 = 6, 6 × 8 = 48 (if 6 is seen) If no marks, award SC2 for an answer of 48 (calculating the number of servings) award SC1 for a fully correct method that would lead to 48 (the number of servings) provided unit conversions are correct e.g. 1650 ÷ (275 ÷ 8) or 1.65 ÷ (0.275 ÷ 8) or (1650 ÷ 275) × 8 (6 is not seen)
	(5)	

14.		No marks are awarded for an unsupported answer of 8.
0.054 × 2500 oe	M1	Allow M1 for 2500×1.054^n oe where $n \geq 1$
= (£) 135	A1	CAO. May be implied by e.g. 1 year = (£)2635
(3500 – 2500) ÷ 135 oe	M1	FT 'their 135' provided M1 previously awarded
OR (using multiples of 135/repeated addition) 2500 + 135 × n (working towards 3500) OR 135 × n (working towards 1000)		Note: If using trials of 2500 + 135 × n or 135 × n then there must be at least two improving trials seen where n > 1. Note: If using repeated additions of 135, there must be enough additions that would take them to the value that is just below or just above 3500 or 1000
= 8 (years)	A2	Note: Award final M1 A2 for an answer of 8, provided 135 is seen and it is not from incorrect work. Award A1 for 7(.4…..) If using multiples of 135/repeated addition: Award final M1A2 for 8 years = (£) 3580 or 8 years = (£) 1080 with no further trials (unless an answer other than 8 (years) is indicated) Award final M1A1 for 7 years = (£) 3445 or 7 years = (£) 945 FT 'their 135' for A2 or A1, provided M1 M1 previously awarded. Note: When repeated addition is used and there are errors in accuracy: • If there is 1 error which leads to a final answer of 8 award A1 • If there is 1 error which leads to a different answer e.g. between 8 and 9, 9 must be chosen in order to award A1. • If there are 2 errors, award A0 If no marks, or if only M1 has been awarded, award M0 SC2 for an answer of 7 years (from use of compound interest) AND either of the following: • $2500 \times 1.054^6 = 3427.54(9..)$ or 3427.55 • $2500 \times 1.054^7 = 3612.63(6..)$ or 3612.64

Alternative method 1 *(3500 – 2500) ÷ 2500 × 100* *= 40(%)* *40 ÷ 5.4 oe* *OR* *(using multiples of 5.4/repeated addition)* *5.4 × n (working towards 40)* *= 8 (years)*	 *M1* *A1* *M1* *A2*	*No marks are awarded for an unsupported answer of 8.* *CAO* *FT 'their 40' provided M1 previously awarded* *Note: If using trials of 5.4 × n then there must be at least two improving trials seen where n > 1.* *Note: If using repeated additions of 5.4, there must be enough additions that would take them to the value that is just below or just above 40* *Note: Award final M1 A2 for an answer of 8, provided 40(%) is seen and it is not from incorrect work.* *Award A1 for 7(.4…..)* *If using multiples of 5.4/repeated addition:* *Award final M1A2 for* *8 years = 43.2(%) with no further trials (unless an answer other than 8 (years) is indicated)* *Award final M1A1 for* *7 years = 37.8(%)* *FT 'their 40' for A2 or A1, provided M1 M1 previously awarded.* *Note:* *When repeated addition is used and there are errors in accuracy:* • *If there is 1 error which leads to a final answer of 8 award A1* • *If there is 1 error which leads to a different answer e.g. between 8 and 9, 9 must be chosen in order to award A1.* • *If there are 2 errors, award A0*

Alternative method 2 *3500 ÷ 2500 × 100* *= 140(%)* *(140 – 100) ÷ 5.4 oe* *OR* *(using multiples of 5.4/repeated addition)* *100 + 5.4 × n (working towards 140)* *= 8 (years)*	 *M1* *A1* *M1* *A2*	*No marks are awarded for an unsupported answer of 8.* *CAO* *FT 'their 140' provided M1 previously awarded* *Note: If using trials of 100 + 5.4 × n then there must be at least two improving trials seen where n > 1.* *Note: If using repeated additions of 5.4, there must be enough additions that would take them to the value that is just below or just above 40* *Note: Award final M1 A2 for an answer of 8, provided 140(%) is seen and it is not from incorrect work.* *Award A1 for 7(.4…..)* *If using multiples of 5.4/repeated addition:* *Award final M1A2 for* *8 years = 143.2(%) with no further trials (unless an answer other than 8 (years) is indicated)* *Award final M1A1 for* *7 years = 137.8(%)* *FT 'their 140' for A2 or A1, provided M1 M1 previously awarded.* *Note:* *When repeated addition is used and there are errors in accuracy:* • *If there is 1 error which leads to a final answer of 8 award A1* • *If there is 1 error which leads to a different answer e.g. between 8 and 9, 9 must be chosen in order to award A1.* • *If there are 2 errors, award A0*
Alternative method 3 (use of SI = PTR/100) *(T =)* $\frac{(3500 - 2500) \times 100}{2500 \times 5.4}$ *8 (years)*	*M3* *A2*	*M2 for use of (3500 – 2500) =* $\frac{2500 \times T \times 5.4}{100}$ *with at least two improving trials where T > 1* *M1 for (3500 – 2500) =* $\frac{2500 \times T \times 5.4}{100}$ *A1 for 7(.4…..)*
	(5)	

15. 21.84 - 1.4 × 9.6(0) (= 8.4) oe ÷ 0.8 oe = (£)10.5(0) or 1050(p)	 M2 m1 A1	Allow the marks for the equivalent in pence. May be seen in stages M1 for 1.4 × 9.6(0) oe (= 13.44) or 9.6(0) + 0.4 × 9.6(0) (= 9.6(0) + 3.84 = 13.44) oe FT from M2 only CAO If units are given, they must be correct. If no marks, award SC1 for an answer of (£) 15.3(0) from (21.84 – 9.6) ÷ 0.8
	(4)	
16. $\widehat{PRS}$ = 48(°) (alternate angles are equal) $\widehat{UTR}$ = 127(°) (angles on a straight line = 180°) (x =) 360 – 127 – 112 − 48 = 73(°) (angles in a quadrilateral = 360°) At least two of the reasons given above but must include <u>alternate angles</u>. <u>*Alternative final two marks*</u> *(assuming x = 73°)* *($\widehat{QPR} = \widehat{PRS}$ =)* *360 – 127 – 112 − 73 = 48(°)* *(angles in a quadrilateral = 360°)* *At least two of the reasons given above but must include <u>alternate angles</u>.*	 B1 B1 B1 E1 *B1* *E1*	Angles may be seen on the diagram. Must be correctly placed on the diagram or appropriately labelled Must be correctly placed on the diagram, appropriately labelled or unambiguously shown on the working lines Award E1 provided at least B1 B1 awarded *Award E1 provided at least B1 B1 awarded*

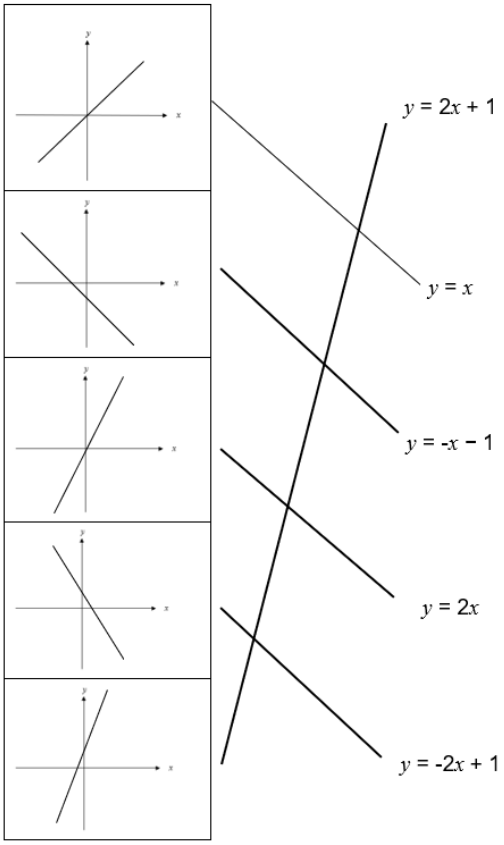
Alternative method		*Angles may be seen on the diagram.*
$P\hat{U}T$ = 68(°) *(angles on a straight line = 180°)*	*B1*	*Must be correctly placed on the diagram, appropriately labelled or unambiguously shown on the working lines*
$U\hat{P}T$ = 59(°) *(angles in a triangle = 180°)*	*B1*	*FT 'their 68(°)'* *Must be correctly placed on the diagram, appropriately labelled or unambiguously shown on the working lines*
(x = 180 - $U\hat{P}T$ - $R\hat{P}Q$ = 73(°)) *(x =) 180 – 59 – 48 = 73(°)* *(allied/co-interior angles sum to 180°)*	*B1*	
At least two of the reasons given above but must include allied/co-interior angles	*E1*	*Award E1 provided at least B1 B1 awarded*
Alternative final two marks *(using properties of a parallelogram)*		
x = (360 – 2 × (59 + 48)) ÷ 2 = 73(°) *(opposite angles in a parallelogram are equal and sum to 360°)*	*B1*	
At least two of the reasons given above but must include opposite angles in a parallelogram are equal and sum to 360°	*E1*	*Award E1 provided at least B1 B1 awarded* *Allow pairs of angles in a parallelogram are equal* *Note to markers* *Allow other full and complete methods to prove that x = 73(°) with appropriate reasons e.g.* *$P\hat{R}S$ = 48(°) (alternate angles)* *and $P\hat{R}S$ + $R\hat{P}S$ + $P\hat{S}R$ = 48 + 59 + 73 = 180(°)* *(angles in a triangle = 180°)*
	(4)	

17.(a) $\frac{64 \times 1.6}{80} \times 60$ or $\frac{64}{80 \div 1.6} \times 60$ oe	M3	May be seen in stages. M2 for one of the following: • $\frac{64 \times 1.6}{80}$ oe (= 1.28 hours) • $\frac{64}{80 \div 1.6}$ oe (= 1.28 hours) • $\frac{64}{80} \times 60$ oe (= 48) M1 for one of the following: • 64 × 1.6 oe (= 102.4) • 80 ÷ 1.6 oe (= 50) • $\frac{64}{80}$ oe (= 0.8)
= 76.8 or 77 (minutes) or 1 hour 16.8 minutes or 1 hour 17 minutes	A1	CAO
18:52 or 6:52 pm	B1	FT 'their 77' provided M3 awarded Allow 6:52 but not 6:52 am or 06:52 If no marks, or if only M1 has been awarded, award M0 SC3 for a final answer of 19:42 or 7:42 pm (from use of 106 miles $\frac{(10+32+64) \times 1.6}{80} \times 60$)
17.(b) 102.6(0) ÷ 1.52 ÷ 4.5 or $\frac{102.6(0)}{1.52 \times 4.5}$	M2	M1 for one of the following: • 102.6(0) ÷ 1.52 (= 67.5) • 1.52 × 4.5 (= 6.84)
= 15	A1	
	(8)	
18.(a)* A correct description e.g. 'The further the apartment is from the city centre the less it costs (per square metre).' 'The closer the apartment is to the city centre the more it costs (per square metre).'	E1	For any **one** of these, or equivalent statement. Ignore additional comments. Allow e.g. 'negative correlation'. '(Inversely proportional,) as the distance increases the price decreases.' 'As one goes up the other goes down.' 'Further from the centre you get more square metres for your money'. Do not accept e.g. 'negative' 'Inversely proportional' (and no other statement)
18.(b)* (£) 5400	B1	Mark final answer

18.(c)* 'No' selected or implied with a valid reason e.g. 'Other factors affect the cost as well as distance from the city centre.' 'The selling price will depend on the apartment.' 'It is the value from the line of best fit, (but this is not necessarily true for all apartments.)' 'Not all points are on the line of best fit, it is an estimate.' 'The value is an estimate (from 12 apartments).'	E1	For any **one** of these, or equivalent statement. Ignore additional comments. Allow 'No' selected or implied with a valid reason e.g. 'Not enough data (as only 12 apartments).' 'It is not showing all the apartments.' 'The line of best fit only displays an average, not exact values.' 'It's just an average cost for apartments.' 'There is no data for 6 miles (from the centre).' Do not accept e.g. 'The line of best fit is not 100% accurate.' 'Because 8 miles is cheaper.' 'Because at 7 miles the apartment is £5200.' 'The graph shows there can be lots of different values.'
18.(d)* Midpoints: 125, 175, 225, 275, 325 125×8 + 175×12 + 225×9 + 275×5 + 325×1 ÷ 35 195 thousand pounds or (£)195 000	 B1 M1 m1 A1	 May be implied from correct totals, see below. FT 'their midpoints' provided at least 4 of these are at the bounds or within the groups 1000 + 2100 + 2025 + 1375 + 325 (= 6825) If mid-points are **not** given, then no marks except for the following cases: • B1 M0 for five correct products not added • B1 M1 for five correct products in an addition • B0 M1 for four correct products in an addition • B0 M1 for consistent use of upper or lower bounds FT provided M1 m1 awarded for the correct evaluation using their midpoints. Allow truncated or rounded decimal FT answers. Allow an answer of (£)195.
	(7)	

19.* (Total value of 20p's =) (£)8.4(0)	B2	Allow the marks for the equivalent in pence. B1 for one of the following • 3.6(0) ÷ 3 × 7 oe • 3.6(0) ÷ 3 × 4 + 3.6(0) oe • (Jamie's 20p coins total) (£)4.8(0)
(No of 20p coins (£)8.4(0) ÷ (£)0.2(0) =) 42 (20p coins)	B1	FT 'their derived 8.4(0)' Accept FT answers rounded or truncated to the nearest whole number
(No of 10p coins) 42 ÷ 7 × 2 oe	M1	FT 'their 42' coins
= 12 (10p coins)	A1	Accept FT answers rounded or truncated to the nearest whole number
(12 × £0.1(0) + 42 × £0.2(0) =) (£)9.6(0) or 960(p)	B1	FT provided M1 awarded If M0, award a further SC1 for the correct evaluation of 'their derived 8.4(0)' ÷ 7 × 9 (£10.8(0) if 8.4(0) used) Award SC3 if (£)9.6(0) or 960(p) is unsupported
Alternative method for the first 3 marks (No. of 20p coins Rona has = 3.6(0) ÷ 0.2(0) =) 18	B1	
(Total no. of 20p coins =) 42	B2	B1 for one of the following • 18 ÷ 3 × 7 oe • 18 ÷ 3 × 4 + 18 oe • (No of 20p coins Jamie has =) 24
<u>Alt method from total value of 20p's for the final 4 marks</u> *Must be unambiguously obtaining the total value of the 10p coins* *(Total in Greg's jar =)* *8.4(0) + 8.4(0) ÷ 7 (× 2 ÷ 2)*	*M3*	*FT 'their derived 8.4(0)'*
(= 8.4(0) + 1.2(0) =) (£)9.6(0) or 960(p)	*A1*	*Accept FT answers rounded or truncated to the nearest 10p*
	(6)	

20.*		Answer line takes precedence. Working may be seen in stages.
Correct method to calculate diameter (d =) $\sqrt{13^2 + 13^2}$ or $\sqrt{338}$ OR (d =) $\frac{13}{\sin(45)}$ or (d =) $\frac{13}{\cos(45)}$	M2	May be implied by $\sqrt{338}$, $13\sqrt{2}$, 18.3(84..) or 18.4 M1 for one of the following: (d^2 =) $13^2 + 13^2$ or (d^2 =) 338 $\sin(45) = \frac{13}{d}$ or $\cos(45) = \frac{13}{d}$
÷ 2 (to find radius)	m1	FT from M2 only May be implied by a radius of $\frac{13\sqrt{2}}{2}$ or $\sqrt{84.5}$ or 9.1(9..) or 9.2
(Area =) π × (9.19..)^2 oe	m1	FT 'their radius' provided M2 m1 or M3 previously awarded.
= 265.5 (cm^2)	A1	CAO Allow answers in the range 265.3 to 265.5 inclusive from correct working. Accept answers correct to 1 d.p. from correct working e.g. 265.9 (from $\pi \times 9.2^2$) 265.2 (from 3.14 × 9.19^2) 265.8 (from 3.14 × 9.2^2) Mark final answer Note: Award A0 if answer given in terms of π e.g. 84.5π If no marks, award SC1 for appropriate sight of $13^2 + 13^2$ or 338 incorrectly labelled or for r = $\sqrt{13^2 + 13^2}$
Alternative method for first 3 marks *Correct method to calculate radius* *(r =) $\sqrt{6.5^2 + 6.5^2}$ or $\sqrt{84.5}$* *OR* *(r =) 13sin(45) or (r =) 13cos(45)* *If a correct method for r seen but then spoiled e.g. (r =) $\sqrt{6.5^2 + 6.5^2} \div 2$ award M2 only*	*M3*	*Working may be seen in stages.* *May be implied by a radius of $\frac{13\sqrt{2}}{2}$ or $\sqrt{84.5}$ or 9.1(9..) or 9.2 or $\sqrt{\frac{13^2}{2}}$* *Allow M3 for r^2 = 84.5 or $\frac{13^2}{2}$ if used in area = $\pi \times r^2$* *M2 for one of the following:* *(r^2 =) $6.5^2 + 6.5^2$ or (r^2 =) = 84.5 or $(r^2 =) \frac{13^2}{2}$* *sin(45) = $\frac{r}{13}$ or cos(45) = $\frac{r}{13}$* *M1 for $r^2 + r^2 = 13^2$ or $2r^2 = 13^2$*
	(5)	

21.(a)* All four equations correctly matched.  	B2	B1 for two or three equations correctly matched not including y = x
21.(b)* Correct equation circled or clearly indicated. $2y = 6x + 8$	B1	
21.(c)* y = a(x - b) or a(x -b) = y or y = -a(-x + b) or y = ax – ab oe	B2	Allow B2 for y = (x - b) × a or y = a ×(x - b) Mark final answer. B1 for one of the following as the first step • $\frac{y}{a} = x - b$ or $x - b = \frac{y}{a}$ • $-\frac{y}{a} = -x + b$ • $y + ab = ax$ Allow B1 if 'y =' missing e.g a(x - b) or a × (x - b) or ax – ab OR an answer of y = a(x + b) or y = ax + ab oe (from $\frac{y}{a}$ = x + b) B0 for an unsupported answer of y = ax – b or y = a × x – b
	(5)	

22.(a)* Bag A branches completed correctly $\frac{2}{5}$ and $\frac{3}{5}$ oe or 0.4 and 0.6 Both pairs of Bag B branches completed correctly $\frac{3}{4}$ and $\frac{1}{4}$ AND $\frac{3}{4}$ and $\frac{1}{4}$ oe or 0.75 and 0.25 AND 0.75 and 0.25	 B1 B2	Allow the use of percentages. B1 for one of the following: • $\frac{3}{4}$ and $\frac{1}{4}$ oe in the correct place on one pair of Bag B branches • Both pairs of Bag B branches completed with $\frac{3}{4}$ and $\frac{1}{4}$ oe the wrong way around
22.(b)* (P(RB) + P(BR) + P(BB) =) $\frac{2}{5} \times \frac{1}{4} + \frac{3}{5} \times \frac{3}{4} + \frac{3}{5} \times \frac{1}{4}$ oe ($\frac{2}{20}$ + $\frac{9}{20}$ + $\frac{3}{20}$ or 0.1 + 0.45 + 0.15) or (1 – P(RR) =) 1 – $\frac{2}{5} \times \frac{3}{4}$ oe (1 - $\frac{6}{20}$ or 1 – 0.3) or (P(RB) + P(B) =) $\frac{2}{5} \times \frac{1}{4} + \frac{3}{5}$ oe ($\frac{2}{20} + \frac{3}{5}$ or 0.1 + 0.6) = $\frac{14}{20}$ oe or 0.7 ISW	 M2 A1	Allow a restart in (b) FT from (a) provided at least B1 awarded and the values on every pair of branches add to 1. M1 for any one of the following: • $\frac{2}{5} \times \frac{1}{4}$ oe (=$\frac{2}{20}$ or 0.1) • $\frac{3}{5} \times \frac{3}{4}$ oe (=$\frac{9}{20}$ or 0.45) • $\frac{3}{5} \times \frac{1}{4}$ oe (=$\frac{3}{20}$ or 0.15) • $\frac{2}{5} \times \frac{3}{4}$ oe (=$\frac{6}{20}$ or 0.3) • a stated correct FT probability from (a) FT from M2 only provided a numeric value given
	(6)	

23.(a)*		
15 × cos(38) or 15 × sin(90 - 38)	M2	Allow M2 for equivalent complete methods If not M2 award M1 for one of the following • $\cos(38) = \frac{AB}{15}$ oe • $\sin(90 - 38) = \frac{AB}{15}$ oe
= 11.8(2…) (cm)	A1	Allow 12 from correct working. Radians | Grads 15cos(38) | 14.326.. | 12.406… 15 sin(52) | 14.799.. | 10.93..
23.(b)*		
$\tan^{-1}(\frac{19}{17})$	M2	Allow M2 for equivalent complete methods M1 for $\tan(D\hat{E}F) = \frac{19}{17}$
= 48.1(798…)(°) rounded or truncated	A1	Allow A1 for 48(°) from correct working Radians | Grads $\tan^{-1}(\frac{19}{17})$ | 0.84(08..) | 53.5(3.….) or 54
	(6)	