GCSE MARKING SCHEME

SUMMER 2024

GCSE
MATHEMATICS – COMPONENT 2
(HIGHER TIER)
C300UB0-1

About this marking scheme

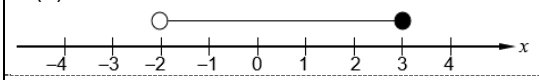
The purpose of this marking scheme is to provide teachers, learners, and other interested parties, with an understanding of the assessment criteria used to assess this specific assessment.

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.

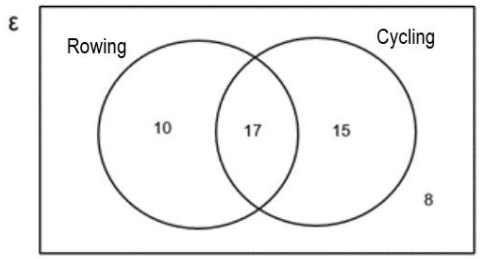
Without the benefit of participation in the examiners' conference, teachers, learners and other users, may have different views on certain matters of detail or interpretation. Therefore, it is strongly recommended that this marking scheme is used alongside other guidance, such as published exemplar materials 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 2024 MARK SCHEME

GCSE (9-1) Mathematics Component 2: Higher Tier	Mark	Comment
1*. Mid-points: 75, 85, 95, 105, 115	B1	May be implied from correct totals, see below.
$75 \times 5 + 85 \times 7 + 95 \times 12 + 105 \times 11 + 115 \times 10$	M2	FT 'their mid-points' provided at least 4 of these are at the bounds or within the groups 375 + 595 + 1140 + 1155 + 1150 (= 4415) M1 for the addition of five products allowing one error with the frequencies. If mid-points are **not** given, then no marks except for the following cases: • B1 M0 for five correct products not added • B1 M2 for five correct products in an addition • B0 M1 for four correct products in an addition
$\div 45$	m1	
$98\frac{1}{9}$ or $\frac{883}{9}$ or 98.1(1…) (seconds)	A1	FT provided M2 m1 awarded, for the correct evaluation using their mid-points Allow 98 from correct working. Allow truncated or rounded decimal FT answers.
	(5)	
2*.(a) $(x - 8)(x + 3)$ ISW	B2	B1 for a pair of brackets (using integers only) that expand to give, $x^2 - 5x \pm \ldots$ or $x^2 \pm \ldots - 24$ e.g. $(x + 8)(x - 3)$ or $(x - 6)(x + 1)$
2.(b) $27h^6$	B2	Mark final answer B1 for kh^6 or $27h^n$ where $k > 1$ and $n > 1$
2.(c) 	B1	
	(5)	

3.* $(BC^2 =)\ 7.2^2 + 5.4^2$ or $(BC^2 =)\ 81$ $(BC =)\ \sqrt{7.2^2 + 5.4^2}$ or $\sqrt{81}$ (BC =) 9 (cm) (Area =) $\frac{4.9 \times 9}{2}$ = 22.05 (cm^2)	 M1 A1 A1 m1 A1	Allow equivalent methods May be shown in further working. FT from M1 for the correctly evaluated square root of 'their 81' provided their answer > 7·2. FT 'their 9' FT. Accept 22 or 22.1 from correct working.
	(5)	
4*.(a) Correctly completing the tree diagram 0.6, 0.75, 0.25, 0.75 oe	B2	B1 for a correct pair of branches (total 1)
4.(b) 0.6 × 0.25 = 0.15 oe.	M1 A1	FT their tree diagram provided their values are between 0 and 1 FT Ignore incorrect conversion of 'their 0.15' to another form if the correct answer seen. Do not ignore further calculations.
	(4)	
5*.(a) 4×0.55^7 400×0.55^7 = 0.06089…. or 0.0609 (m) 6.089….. or 6.09 (cm)	M2 A1	M1 for 4×0.55^n or 400×0.55^n where $1 \leq n < 9$ CAO. If units are given they must be correct Mark final answer. Accept 0.061 or 0.06 (m) , 6.1 or 6 (cm) from correct working **provided no inaccurate working seen.** If no marks, award SC1 for an answer of 0.0149.. or 0.015 (m) or 1.49.. (cm) or 1.5 (cm) (from 4×0.45^7 or 400×0.45^7)
5.(b)(i) A correct assumption e.g. 'The surface it bounces on is the same on each bounce.' 'The ball bounces on level ground.' 'That the 55% is correct for <u>all</u> bounces.' 'No energy is lost elsewhere.' 'There is no wind.' 'There was nothing in the way.'	E1	Allow e.g. 'It is flat.' – implies the surface 'No other forces acting on the ball.' 'Nothing interfered with the bouncing.' Do not allow e.g. 'It was dropped without force. ' 'The ball is dropped with the same force every time.'
5.(b)(ii) A correct effect of the assumption e.g. 'There will be no change to my answer.'	E1	If no valid assumption is made, then this mark cannot be awarded. Cannot award E0 E1. The effect must follow their assumption.
	(5)	

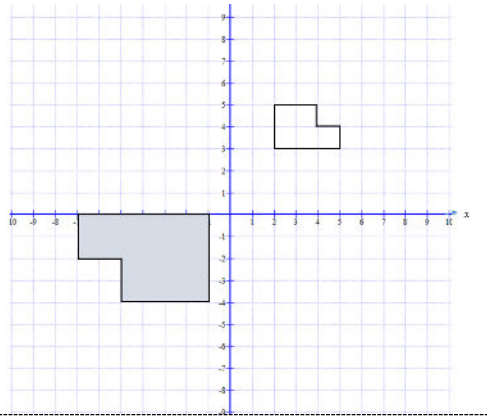
6.*(a) A fully correct Venn diagram  	B2	If zero is seen in the intersection award no marks. All blank spaces are assumed to be zero B1 for one of the following: • 8 and 17 correctly placed • 8 correct, Rowing 27 AND Cycling 32 e.g. 11, 16, 16 • 8 correct, Rowing 27 OR Cycling 32 AND the three values that add to 42 e.g. 11, 16, 15 • 10, 17, 15 correct and 8 omitted
6.(b) $\frac{10}{50}$ or $\frac{1}{5}$ oe ISW	B2	FT their Venn diagram provided no sections are left blank or zero. Mark to the candidates advantage. FT $\frac{\text{'their 10'}}{50}$ provided 'their 10' < 27 B1 for $\frac{\text{'their 10'}}{\text{'their 50'}}$ provided 'their 10' < 27 B1 for $\frac{\text{'their 10'}}{n}$ provided 'their 10' < 27 and 'their 10' < n < 50 Penalise incorrect notation (e.g. '10 in 50') −1.
	(4)	
7*. 825 × 6.27 = 5172.75 (R$) 5150 (R$) 5150 ÷ 6.27 = (£) 821.37 ISW	M1 A1 A1 M1 A1	 FT 'their 5172.75' rounded down to the nearest 50 provided M1 previously awarded Sight of 5150 (R$) with no incorrect working implies M1 A1 A1 Strict FT 'their 5150' provided a multiple of 50 If 5150 not seen award M1 and the previous A1 for 103 × 50 ÷ 6.27 FT Answer must be correct to the nearest penny If final M0 A0, then award a further SC1 for (£)3.63 (left) or similar FT
Alternative method *825 ÷ (50 ÷ 6.27)* *=103.4(5….)* *(103 × 50 =) 5150* *5150 ÷ 6.27* *= (£) 821.37 ISW*	*M1* *A1* *A1* *M1* *A1*	 *Award M1 A0 for 825 ÷ 7.97 = 103.5…* *FT 'their 103(….) × 50 ' provided 'their 103(….)' has been rounded down and M1 previously awarded* *Strict FT 'their 5150' provided a multiple of 50* *If 5150 not seen, award M1 and the previous A1 for 103 × 50 ÷ 6.27* *FT Answer must be correct to the nearest penny* *If final M0 A0, then award a further SC1 for (£)3.63 (left) or similar FT*
	(5)	

8.* $R = \frac{P^3}{Q}$	B2	B1 for one of the following: • $RQ = P^3$ • $R = P^3 \div Q$ • $\frac{P^3}{Q}$ (R omitted) B0 for $P^3 \div Q$
	(2)	
9.(a) $14x^2 – 16xy – 3xy + 15y^2$ convincingly leading to $14x^2 – 19xy + 15y^2$	B2	B1 for either $14x^2 – 16xy$ or $-3xy + 15y^2$
9.(b) A correct explanation e.g. 'The expression is true for all values of x and y.' 'It is always true'	E1	Allow, e.g. 'The different expressions have the same value.' 'To show the two expressions are identical.' Do not allow, e.g. 'It means they are identical.' 'It represents the same thing written in different ways.' Explanations involving equations.
	(3)	
10. Correct position of D with both constructions completed correctly.	B4	Award B2 for each of the following: • Correct angle bisector drawn from construction with appropriate arcs. • Correct perpendicular bisector drawn from construction with appropriate arcs. Award B1 for each of the following: • Angle bisector drawn within tolerance (± 2°). or a correct angle bisector construction with appropriate arcs but no line • Perpendicular bisector drawn within tolerance (± 2 mm) without arcs or with invalid arcs or for a correct pair of arcs that intersect twice. Penalise -1 if the lines do not intersect. If no marks award SC1 for the correct position of D given
	(4)	

11. (Force =) 0.97 × π × 24^2 = 0.97 1809.557 0.97 = Force/(3619.11..) gains the M1 (Force =) 0.97 × 3619.11.. Answers in the range 1754 to 1756	M3 A1	May be seen in stages M2 for 0.97 = $\frac{Force}{\pi \times 24^2}$ If not M2, award M1 for one of the following: • 0.97 = Force/(k x π × 24²) where k is an integer > 1 • (Force =) 0.97 × k x π × 24² where k is an integer > 1 • sight of (Area of base =) π × 24² CAO Award A0 if the answer is given as a multiple of π
	(4)	
12. $\frac{35}{\tan(72)}$ or 35tan(90 - 72) or $\frac{35sin(90-72)}{sin(72)}$ or $\sqrt{\left(\frac{35}{sin(72)}\right)^2 - 35^2}$ or $\sqrt{(36.8..)^2 - 35^2}$ 11.3(7…) or 11.4 (m) AND Yes, indicated or implied.	M2 A2	Allow an alternative **full** method M1 for $\tan(72) = \frac{35}{dist}$ or tan(90 – 72) = $\frac{dist}{35}$ or $\frac{dist}{sin(90-72)} = \frac{35}{sin(72)}$ oe or $(36.8..)^2 - 35^2$ A1 for one of the following • 11.3(7…) or 11.4 (m) and no decision or incorrect decision • a correct decision FT their incorrect answer from M2
	(4)	
13. One correct evaluation 2 ≤ x ≤ 3 2 correct evaluations 2·55 ≤ x ≤ 2·75, one < 0, one > 0. 2 correct evaluations 2·55 ≤ x ≤ 2·65, one < 0, one > 0. x = 2·6	 B1 B1 M1 A1	Correct evaluation regarded as enough to identify if < 0 or > 0. If evaluations not seen accept 'too high' or 'too low'. Note: Some candidates may test $2x^3 - 5x = 23$ x / $2x^3 - 5x - 23$ 2 -17 2.62 -0.130… 2·1 -14.978 2.63 0.232… 2·2 -12.704 2.64 0.559…. 2·3 -10.166 2·4 -7.352 2·5 -4.25 2.55 -2.587… **2·6 -0.848 2.65 0.969…** **2·7 2.866** 2.75 4.843… 2·8 6.904 2·9 11.278 … 3 16 Note: Evidence for M1 must be seen before A1 can be awarded.
	(4)	

14. Correct equation with fractions removed or over a common denominator e.g. $\frac{12x+15-2x-2}{(6)} = \frac{5}{(6)}$ or $\frac{10x+13}{(6)} = \frac{5}{(6)}$ $\frac{10x+17}{(6)} = \frac{5}{(6)}$ leads to x = -1.2 B1 B1 B1 10x = -8 oe x = -0.8 oe	B2 B1 B1	May be seen in stages. FT until 2nd error. B1 for 1 error OR for one of the following: • $\frac{3(4x+5)-2(x+1)}{(6)} = \frac{5}{(6)}$ • $\frac{3(4x+5)}{(6)} - \frac{2(x+1)}{(6)} = \frac{5}{(6)}$ • $\frac{12x+15}{(6)} - \frac{2x+2}{(6)} = \frac{5}{(6)}$ • $\frac{6(4x+5)}{2} - \frac{6(x+1)}{3} = \frac{5}{6} \times 6$ oe • $\frac{10x+13}{(6)}$ FT from B1 or from one slip If FT answer is a whole number, then it must be shown as an integer. If a FT answer is given as a decimal it must be correctly rounded, or truncated, to 2 dp <u>Note:</u> An unsupported answer of -0.8 is awarded no marks.
	(4)	
15. (Mass =)$14\pi y^3$ (g) ISW	B3	Allow use of other letters for y. If not B3 then award, B2 for either of the following: • an answer of $43.9(8\ldots)y^3$ or $44y^3$ • sight of $7 \times \frac{1}{3} \times \pi \times y^2 \times 6y$ OR B1 for sight of $\frac{1}{3} \times \pi \times y^2 \times 6y$ or $2\pi y^3$
	(3)	

16.(a) Yes indicated, or implied, with a valid reason referencing 60 and 74 e.g. 'The median (time playing video games) for 14-year-olds is 74 minutes and the median (time playing video games) for 10-year-olds is 60 minutes.' 'The median for 14-year-olds is 14 (minutes) larger (than the median for 10-year-olds).' May be in two separate statements	E1	Check diagrams for values. Allow e.g. 'The average (time playing video games) for 14-year-olds is 74 minutes and the average (time playing video games) for 10-year-olds is 60 minutes.' '50% of 10-year-olds spent 60 minutes or more, whereas 50% of 14-year-olds spent 74 minutes or more'. '74 is greater than 60.' Do not allow e.g. 'The median for 14-year-olds is 74 minutes and the median for 10-year-olds is 72 minutes.' 'The median for 14-year-olds is bigger than the median for 10-year-olds' unless both medians seen on the diagrams.
16.(b)(i) 25	B1	
16.(b)(ii) $\frac{80-76}{80}$ (× 100) 5	M1 A1	 Answer line takes precedence. If no marks awarded, award SC1 for 95%.
16.(c) IQR (for 10-year-olds) = 44(minutes) AND IQR (for 14-year-olds) = 76(minutes) With a valid conclusion e.g. '14-year-olds have a bigger variation/spread of times (spent playing video games) than 10-year-olds.'	 E2	Check for values given on the diagrams Allow use 'range' instead of IQR in the conclusion for E2 or E1 E1 for both correct values for the IQR without a conclusion or with an incorrect conclusion. OR E1 for one IQR correctly and the other incorrectly calculated with the correct FT conclusion. Do not allow e.g. 'The number of 14-year-olds (who played videogames) is more varied as the IQR is higher'
	(6)	

17.(a) $\frac{4}{5} \times \frac{3}{10}$ or 0.8 × 0.3 oe $= \frac{12}{50}$ or $\frac{6}{25}$ or 0.24 oe ISW	M1 A1	
17. (b) $\frac{4}{5} \times \frac{7}{10} \times \frac{1}{5}$ or 0.8 × 0.7 × 0.2 oe $= \frac{28}{250}$ or $\frac{14}{125}$ or 0.112 oe. ISW	M1 A1	
	(4)	
18. 3050 ÷ 715 = 4.26(5….) or 4.266 or 4.27(m/s)	M2 A1	Answer line takes precedence. Allow 3049.999.. for 3050, must clearly be a recurring 9. M1 for 'their 3050' ÷ 'their 715' provided 3000 < 'their 3050' ≤ 3100 AND 710 ≤ 'their 715' < 720. CAO from M2 only Accept 4.3 from correct working Note: No marks for unsupported answers
	(3)	
19. The correct enlargement in the correct position. 	B3	B2 for one of the following: • a completed shape with at least 4 correct vertices • all 6 correct vertices seen but not joined • a correct enlargement of scale factor -2 about (0, 0) or (2, 1) B1 for either of the following: • a correct enlargement of scale factor +2 or scale factor -1 about (1, 2) • an inverted shape of the correct size and orientation not awarded B3 or B2.
	(3)	

20. $R\hat{O}T = 132(°)$ (The angle at the centre is twice the angle at the circumference)	B1	Angles may be seen on the diagram. Not for $R\hat{O}T$ reflex = 132(°)
$O\hat{R}Q = 90(°)$ or $O\hat{T}Q = 90(°)$ (A tangent and a radius meet at a right angle)	B1	Right-angle symbol on the diagram is sufficient.
$R\hat{Q}T = 360 – 132 – 90 – 90$ (= 48°) (The sum of the angles in a quadrilateral is 360°) OR $R\hat{Q}T = 2 \times (180 – 90 – \frac{132}{2})$ (= 48°) (The sum of the angles in a triangle is 180°)	B1	*Note: B0 for 180 – 132 = 48 (even if cyclic quadrilateral mentioned!)*
Reasons must include (at least): • The angle at the centre is twice the angle at the circumference. • A tangent and a radius meet at a right angle.	E1	Dependent on B3 previously awarded
Alternative method 1 (starting with 48°)		*Angles may be seen on the diagram.*
$O\hat{R}Q = 90(°)$ or $O\hat{T}Q = 90(°)$ *(A tangent and a radius meet at a right angle)*	*B1*	*Right-angle symbol on the diagram is sufficient*
$R\hat{O}T = 360 – 48 – 90 – 90 = 132°$ *(The sum of the angles in a quadrilateral is 360°)* *OR* *$R\hat{O}T = 2 \times (180 – 90 – \frac{48}{2}) = 132$* *(The sum of the angles in a triangle is 180°)*	*B1*	
$R\hat{S}T = 66(°)$ *(The angle at the centre is twice the angle at the circumference)*	*B1*	
Reasons must include (at least): • *The angle at the centre is twice the angle at the circumference.* • *A tangent and a radius meet at a right angle.*	*E1*	*Dependent on B3 previously awarded*
Alternative method 2 (chord RT°)		*Angles may be seen on the diagram.*
$T\hat{R}Q = R\hat{T}Q = 66(°)$ *(Alternate segment theorem)*	*B2*	*B1 for either angle*
$R\hat{Q}T = 180 – 2 \times 66 = 48°$ *(The sum of the angles in a triangle is 180°)*	*B1*	
Reasons must include (at least): • *Alternate segment theorem.*	*E1*	*Dependent on B3 previously awarded*
	(4)	

21. (Numerator =) $(2x + 5)(2x - 5)$ (Denominator =) $3x(2x - 5)$ $\frac{2x+5}{3x}$ oe	 B2 B1 B1	 B1 for sight of $(2x)^2 - 5^2$ Mark final answer. FT provided no more than 1 previous error and simplification required.
	(4)	
22. (Gradient of the perpendicular line =) -2 5 = -2 × -1 + c or (y – 5) = -2(x + 1) oe or y = –2x + 3 2x + y – 3 = 0 or -2x - y + 3 = 0	 B1 M1 A1	 May be implied in later working FT for gradients of 2 and $-\frac{1}{2}$ only FT Allow y + 2x – 3 = 0 oe Mark final answer <u>Note:</u> B0 M1 A1 for the following Gradient of 2 leading to 2x – y + 7 = 0 oe Gradient of $-\frac{1}{2}$ leading to x + 2y – 9 = 0 oe
	(3)	
23. (W$\hat{X}$Z =) $\sin^{-1}(\frac{\sin(61) \times 11.8}{13.1})$ = 51.9(82…)(°) or 52(°) (YZ =) $\sqrt{13.1^2 + 7.8^2 - 2 \times 13.1 \times 7.8 \times \cos(180 - 51.9(82..))}$ = 18.9(2…) (cm) or 19 (cm)	 M2 A1 M2 A1	Award marks for similar complete methods M1 for $\frac{\sin(W\hat{X}Z)}{11.8} = \frac{\sin(61)}{13.1}$ oe Accept answers in the range 51.9 to 52 FT 'their derived 51.9(82…)' provided at least M1 previously awarded. M1 for $(YZ^2 =) 13.1^2 + 7.8^2 - 2 \times 13.1 \times 7.8 \times \cos(180 - 51.9(82..))$ FT Accept answers in the range 18.9 to 19 inclusive.
<u>Alternative method</u> *(Height of triangle = h =)* *11.8 sin(61) AND (d =)* $\sqrt{13.1^2 - h^2}$ *(d =) 8.068(2….) or 8.07* *(YZ =)* $\sqrt{10.32^2 + (8.07 + 7.8^2)}$ *= 18.9(2…) (cm) or 19 (cm)*	 *M2* *A1* *M2* *A1*	 *h = 10.32…* *FT 'their 8.07' provided M2 previously awarded* *M1 for (YZ² =)* $10.32^2 + (8.07 + 7.8^2)$ *FT* *Accept answers in the range 18.9 to 19 inclusive*
	(6)	

24. (Surface area of small horse =) $640 \div \left(\frac{16}{10}\right)^2$ or $640 \times \left(\frac{10}{16}\right)^2$	M2	M1 for (Area factor =) $\left(\frac{16}{10}\right)^2$ OR $\left(\frac{10}{16}\right)^2$ or 1.6^2 OR 0.625^2 (= 2.56) OR (=0.390…)
= 250 (cm^2)	A1	
(Number of spray paint cans =) (30 × 640 + 50 × 250) ÷ 9300 (=31700 ÷ 9300)	M2	FT 'their 250' provided M1 awarded M1 for 30 × 640 + 50 × 250
= 3.4(08..)	A1	FT from M2 only
(Total cost = 4 × (£)8.45 =) (£) 33.8(0)	B1	FT 'their 3.4(08..)' correctly rounded up provided the previous M2 awarded. Unsupported cost of 4 tins is awarded B0. If no marks award SC2 for answers of • £42.25 from (39200 ÷ 9300 =) 4.215.. tins (using 1.6) • £25.35 from (27012.5 ÷ 9300 =) 2.904.. tins (using 1.6^3)
	(7)	
25. a = 8	B3	Award B2 for any one of the following: • $\left(\frac{a}{2}\right)^2 + \left(\frac{a}{2}\right)^2 = 32$ • $\left(\frac{a}{2}\right)^2 = 16$ • $a^2 = \left(\frac{\sqrt{2a^2}}{2}\right)^2 + \left(\sqrt{32}\right)^2$ • $a^2 = \frac{a^2}{2} + 32$ • sight of $4^2 + 4^2 = 32$ • sight of x = 4 AND y = 4 • sight of (4, 4) If not B2, award B1 for any one of the following: • sight of line and curve meet at $\left(\frac{a}{2}, \frac{a}{2}\right)$ • sight of $x = 4$ (from $2x^2 = 32$ oe) • sight of $y = 4$ (from $2y^2 = 32$ oe) • $2x^2 = 32$ • y = -x + c where c > 0 • $\frac{a^2}{2} + \frac{a^2}{2} = 32$ • $\frac{a^2}{2} = 16$ • $a^2 = \frac{\sqrt{2a^2}^2}{2} + \sqrt{32}^2$

26.(a) 86.4	B2	B1 for 24 × 3600 ÷ 1000 oe If no marks, award SC1 for an answer of 82.8 (from use of 23)
26.(b) Tangent drawn at time 2 seconds. $\frac{\text{Difference in y}}{\text{Difference in x}}$ oe Correctly evaluated gradient from their tangent	M1 m1 A1	M0 if no tangent seen Must use correct values for their tangent Accept answer written as an improper fraction (unless it gives a whole number), mixed number or decimal. If answer given as a decimal, it must be correct to 1 decimal place
26.(c) A correct explanation e.g. 'It is decelerating' 'The acceleration is negative.'	E1	Allow e.g. 'The roller coaster decelerates.' Ignore extra spurious comments. 'The acceleration decreases from t = 4 and then starts to increase again to t = 10.' Do not allow 'The acceleration is decreasing.' 'The velocity is decreasing.'
26.(d) $\frac{(24+21.5)}{2}\times 2+\frac{(21.5+17)}{2}\times 2+\frac{(17+13.5)}{2}\times 2$ $+\frac{(13.5+14.5)}{2}\times 2+\frac{(14.5+18)}{2}\times 2$ (= 45.5 + 38.5 + 30.5 + 28 + 32.5) = 175 (m)	M2 A1	M1 for the sum of any 3 correct trapezia. Accept equivalent as triangles and rectangles FT from M1 If no marks award SC2 for an answer in the range 232 to 235.2 (m) or SC1 for working with widths 2.8 and heights of 0, 22, 22.5 to 23, 16, 13.5 to 14, 18 allowing one error with the heights (Misread and distance from t = 0 to t = 14)
<u>Alternative method</u> $\frac{1}{2}$ *× 2 (24 + 18 + 2(21.5 + 17 + 13.5 + 14.5))* *= 175 (m)*	 *M2* *A1*	 *Award M1 if only one value is incorrect.* *FT from M1*
	(9)	

27. $3x^2 + 2(x^2 - 6x + 9) = 12$ or better	B2	If not B2, award B1 for either: $3x^2 + 2(x - 3)^2 = 12$ or better $3x^2 + 2(x^2 + 6x + 9) = 12$ or better ($y = x + 3$ used)
$5x^2 - 12x + 6 = 0$	B1	Allow B1 for $5x^2 + 12x + 6 = 0$ (from $y = x + 3$) FT from B1 provided only one error in the expansion of $(x - 3)^2$ and an equation of the form $ax^2 + bx + c = 0$ is obtained with a, b and $c \neq 0$. The equation may be implied by appropriate substitution into the quadratic formula.
$(x =) \ \frac{-(-12)\pm\sqrt{(-12)^2-4\times5\times6}}{2\times5}$	M1	**The substitution into the formula must be seen for M1, otherwise award M0 m0 A0.** FT 'their derived $5x^2 - 12x + 6 = 0$' for M1 and possible m1. Allow one slip in substitution **for M1 only** but must be correct formula.
$(x =) \ \frac{12 \pm \sqrt{24}}{10}$	m1	Can be implied from at least one correct value of x evaluated.
(x =) 1.68(9..) or 1.69 or 1.7 and 0.71(0..) or 0.7	A1	CAO
(Solutions =) (1.7, -1.3) and (0.7 , -2.3)	B1	FT their x values provided M1 awarded. Allow for x = 1.7, y = -1.3 and x = 0.7, y = -2.3 Must be correct to 1 decimal place.
Alternative Method *$3(y^2 + 6y + 9) + 2y^2 = 12$ or better*	*B2*	*If not B2, award B1 for either:* *$3(y + 3)^2 + 2y^2 = 12$ or better* *$3(y^2 - 6y + 9) + 2y^2 = 12$ or better ($x = y - 3$ used)*
$5y^2 + 18y + 15 = 0$	*B1*	*Allow B1 for $5y^2 - 18y + 15 = 0$ (from $x = y - 3$)* *FT from B1 provided only one error in the expansion of $(y + 3)^2$ and an equation of the form $ay^2 + by + c = 0$ is obtained with a, b and $c \neq 0$.* *The equation may be implied by appropriate substitution into the quadratic formula.*
$(y =) \ \frac{-(18)\pm\sqrt{(18)^2-4\times5\times15}}{2\times5}$	*M1*	***The substitution into the formula must be seen for M1, otherwise award M0 m0 A0.*** *FT 'their derived $5y^2 + 18y + 15 = 0$ for M1 and possible m1* *Allow one slip in substitution **for M1 only** but must be correct formula.*
$(y =) \ \frac{-18 \pm \sqrt{24}}{10}$	*m1*	*Can be implied from at least one correct value of y evaluated.*
(y =) -1.31(0..) or -1.3 *and -2.28(9…) or -2.29 or -2.3*	*A1*	*CAO*
(Solutions =). (1.7, -1.3) and (0.7 , -2.3)	*B1*	*FT their y values provided M1 awarded.* *Allow for x = 1.7, y = -1.3 and x = 0.7, y = -2.3* *Must be correct to 1 decimal place*
	(7)	