REVISE
.wales

1.15 — Conversion, travel & distance-time graphs

Mark schemes for the 1.15 question pack

Spec 2.5.1, 2.5.2 — Unit 1

SOLUTIONS · 2025 SPECIFICATION

Mark schemes for the 3 questions in the corresponding revise.wales question pack (18 marks total). Sources: legacy WJEC GCSE papers, WJEC SAM, and custom-authored mark schemes. Pack layout © revise.wales.

9(a) 1·65 to 1·75 (seconds) inclusive	B1	
9(b) Split into at least 5 areas and attempt to sum (Area =) ½×1×(0 + 4 + 2(4 + 5 + 4·8 + 4·2)) = 20 (m)	 M1 M1 A1	No marks for an unsupported 20 Allow 1 error Or equivalent (Areas of 2, 4·5, 4·9, 4·5, 4·1) (If 10 areas used, areas of 0·5, 1·5, 2·3, ≈ 2·5, ≈ 2·46, ≈ 2·4, ≈ 2·37, ≈ 2·22, ≈ 2·08, ≈ 2·04) Allow 1 slip in reading the scale CAO A1 for an answer of ≈ 20·4 (m) if 10 areas used CAO
9(c)(i) (Distance travelled by Delyth =) ½ × 3 × 5 (=7·5(m)) (Distance apart =) 12·5 (m)	 B1 B1	 Or full trapezium rule method FT 'their 20' – 7·5 provided first B1 awarded
9(c)(ii) Reason e.g. 'Most area calculations for Catrin are underestimates', or 'The trapeziums lie under the line', or 'The trapeziums cut off bits of the graph', or 'The curve is above the area calculated', or 'The area of the trapeziums is lower than the area under the curve'	E1	Do not accept e.g. 'Parts of the graph haven't been used' 'Doesn't include the bumps' 'Does not take into account the curvature of the graph'

9.(a) Tan x = $\frac{6{\cdot}4}{8{\cdot}2}$	M1	
(x =) $\tan^{-1}$ 0·78(0..) or $\tan^{-1}\frac{6{\cdot}4}{8{\cdot}2}$	A1	
= 38(°) OR 37·9(...°)	A1	Implies previous A1.
Alternative method.		
***Correct** use of 'two-step' method.*	M2	*A partial trigonometric method is M0.*
(x) = 38(°)	A1	*Accept an answer that rounds to 38(°)*
9.(b) (PAQ = 90 – 38 =) 52(°)	B1	FT 90° − 'their 38°'. May be seen on the diagram.
AQ = $\frac{7{\cdot}9}{\sin 52(°)}$	M2	FT 'their clearly defined PAQ' BUT not if PAQ = 'their x'. M1 for sin52(°) = $\frac{7{\cdot}9}{AQ}$
(AQ) = 10(cm) OR 10·0(…cm)	A1	
Alternative method.		
PQA =*38(°)*	B1	FT 'their 38°'. May be seen on the diagram.
AQ = $\frac{7{\cdot}9}{\cos 38(°)}$	M2	FT 'their clearly defined PQA' M1 for cos 38(°) = $\frac{7{\cdot}9}{AQ}$
(AQ) = 10(cm) OR 10·0(…cm)	A1	
Alternative method.		
(PAQ = 90 – 38 =) 52(°)	*B1*	*FT 90° − 'their 38°'.*
***Correct** use of 'two-step' method.*	*M2*	*A partial trigonometric method is M0.* *FT 'their clearly defined PAQ'* *BUT not if PAQ = 'their x'.*
(AQ) = 10(cm)	*A1*	*Accept an answer that rounds to 10(cm)*

11(a)(i) (Area =) $\frac{1}{2} \times 1 \times (14 + 0 + 2(7 + 2 + 1 + 0.4))$ or equivalent = 17.4 (m)	M2 A1	M1 for at most 1 slip in substitution of values from the velocity axis OR M1 for 1 of the vertical readings omitted with all others correct FT from M1
11(a)(i) Alternative method: *(Area =)* $\frac{(14 + 7)}{2} \times 1 + \frac{(7 + 2)}{2} \times 1 + \frac{(2 + 1)}{2} \times 1 + \frac{(1 + 0.4)}{2} \times 1$ $+ \frac{(0.4 + 0)}{2} \times 1$ *[10.5 + 4.5 + 1.5 + 0.7 + 0.2]* *= 17.4 (m)*	*M2* *A1*	*M1 for the sum of these 5 areas with at most one error (may be repeated) in the substitution of values from the velocity axis OR* *M1 for the sight of 5 correct areas with the intention to add them (possibly omitting one)* *FT from M1*
11(a)(ii) Overestimate AND valid reason e.g. 'The trapeziums all extend above the curve', or 'The curve is below the area calculated', or 'The area of each trapezium is greater than the area under the curve', or 'The area of the 2nd trapezium is greater than the area under the curve'	E1	Allow Overestimate AND e.g. 'Does not take into account the curvature of the graph', or 'The lines I have drawn are above the curve' Do not accept e.g. 'Parts of the graph haven't been used'
11(b) Suitable tangent drawn at time 2 seconds Idea of difference in y ÷ difference in x Correct deceleration from difference in y ÷ difference in x in its simplest form	M1 m1 A1	Tangent needs to go through (2, 2) with no 'daylight' between their tangent and the curve If only 1 correct difference seen, then award m1 followed by A0 Allow a negative value Accept a fully simplified improper fraction (unless it gives a whole number), mixed number or decimal. If they give a decimal, it needs to be correctly evaluated to at least 1 decimal place, rounded or truncated Mark final answer