REVISE
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3.27 — Plans, elevations & nets

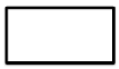
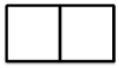
Mark schemes for the 3.27 question pack

Spec 3.3.5, 3.3.6, 3.3.7 — Unit 3

SOLUTIONS · 2025 SPECIFICATION

Mark schemes for the 7 questions in the corresponding revise.wales question pack (22 marks total). Sources: legacy WJEC GCSE papers, WJEC SAM, and custom-authored mark schemes. Pack layout © revise.wales.

			allow SC1 for sight of 15 e.g. '15/50', 15 : 35.
5.(a)	Correct cuboid	B2	For B2, their cuboid must have edges along or parallel to the 3 directions usually associated with isometric paper (the two diagonals and the vertical). B1 for any one edge dealt with correctly for all its three occurrences in a cuboid. For any mark to be awarded the line must go 'through the dots' AND have both ends 'on a dot'. Ignore attempt at handling 'hidden lines'.
5.(b)	(Volume =) $6 \times 4 \times 3$ $= 72$ cm^3.	M1 A1 U1	Any further manipulation to $6 \times 4 \times 3$ is M0. Independent of other marks.

5(a)  or  in any orientation	B1	Allow intention of straight lines and right angles Do not accept if clearly two parallelograms attached rather than rectangles If the roof is split into two rectangles, they must meet along one side and intention must be to draw two identical rectangles (or squares)
5(b) Sight of any of the following: • 4.2 × 50000(cm) • 210 000 • 4.2 × 500 (m) • 1 cm = 0.5 **km** • 2cm = 1 km • an answer to a product involving 4.2× ... with leading digits '21'	B1	Ignore inclusion of incorrect units, allow intention of × 4.2 by 50000 given, i.e allow if leading digits '21' seen
210 000 (cm) ÷ 100 ÷ 1000 or 4.2 × 0.5 or equivalent calculation that would lead to a correct answer (2.1km)	M1	FT 'their 4.2 × 50000' ÷ 100 ÷ 1000 evaluated incorrectly
2.1 (km)	A1	CAO
5(c) Correct pair of arcs (or arc) cutting the road appropriately	B1	<u>Tolerance of ± 2 mm throughout</u>
Correct use of these arc intersections to create a pair of intersecting arcs	B1	<u>Alternative for 1st two B1s:</u> B2 for arcs towards drawing a kite, e.g. from B and C with radii AB and AC respectively (no B1 possible)
Correct placement of the new turbine shown	B1	Allow this mark if arcs not shown, or spurious arcs seen. Allow for sight of intersection of a straight line with the road If B0, B0, B0 award SC1 for correct construction with arcs shown for the perpendicular bisector of the Bryn to Cwm road, then FT for possible final B1
Correct evaluation of appropriate measurement ÷ 2 3.5 (km) to 3.7(km)	B1	Allow this mark if arcs not shown, or spurious arcs seen. *(Note: if perpendicular bisector is drawn the final distance is 3.3 km to 3.5 km)*

4. Choice of length, width and height such that length × width × height = 12 i.e. 12 × 1 × 1 6 × 2 × 1 4 × 3 × 1 3 × 2 × 2	B1	Must be whole numbers for B1. May be seen in any order. Award B1 if length, width and height are not stated but implied by the cuboid drawn.
Correct cuboid drawn	B2	Ignore orientation of cuboid. FT 'their length, width and height'. For B2, their cuboid must have edges along or parallel to the 3 directions usually associated with isometric paper (the two diagonals and the vertical). Award B1 for one of the following: • any one edge dealt with correctly for all its three visible occurrences in a cuboid • a cuboid drawn with volume 12cm^3 with a different length, width and height stated on answer line (e.g. 3 × 2 × 2 stated on answer lines, but 6 × 2 × 1 cuboid drawn). For any mark to be awarded the line must go 'through the dots' AND have both ends 'on a dot'. Ignore attempt at handling 'hidden lines'.

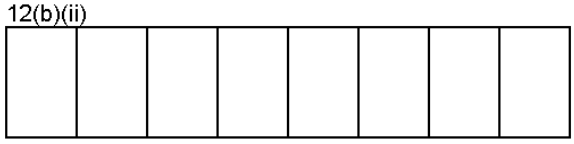
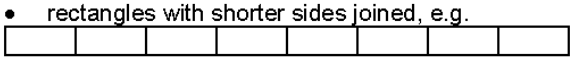
6. (Area of floor =) length × width + ½ × base × height $4.5 \times 8.1 + \frac{5.1 \times (5.5 - 4.5)}{2}$ (36.45) (2.55) = 39 (m^2)	M1 M2 A1	Must be from working with bounds If lower bounds used, they must be in a similar range to those shown for M1 below Use of any formula to calculate the complete area of the floor M1 for 'their 4.5 × 8.1 + $\frac{5.1 \times (5.5 - 4.5)}{2}$' where 4.4 < 'their 4.5' ≤ 4.6 and 8 < 'their 8.1' ≤ 8.2 and 5(.0) < 'their 5.1' ≤ 5.2 and 5.4 < 'their 5.5' ≤ 5.6 If using ½ × base × height, allow 0.8 ≤ height ≤ 1.2 CAO
(Amount of flooring needed =) 39 + 0.1 × 39 or equivalent = 42.9 (m^2) AND 15 packs needed	M1 A1	FT 'their 39' provided 1 mark previously awarded Accept 39/3 + 0.1×39/3 Accept 43 (m^2) AND 15 packs needed Accept 14.3 AND 15 packs needed On FT, accept the amount of flooring correct to 1 d.p. or rounded up to the nearest whole number for 'their 39 + 0.1 × 39' Allow M1A1 for an answer of 15 packs from an area of 39 (m^2) provided no incorrect work seen FT 'their 39' If no marks awarded, SC1 for sight of 4.5, 8.1, and 5.1
Alternative method for first 4 marks: *(Area of floor =)* *length × width + ½×(sum of parallel sides)×height* $4.5 \times (8.1 - 5.1) + \frac{(5.5 + 4.5) \times 5.1}{2}$ *(13.5) (25.5)* = 39 (m^2)	*M1* *M2* *A1*	*Must be from working with bounds* *If lower bounds used, they must be in a similar range to those shown for M1 below* *Use of any formula to calculate the complete area of the floor* *M1 for 'their 4.5 × (8.1−5.1) + $\frac{(5.5 + 4.5) \times 5.1}{2}$'* *where* *4.4 < 'their 4.5' ≤ 4.6 and 8 < 'their 8.1' ≤ 8.2* *and* *5(.0) < 'their 5.1' ≤ 5.2 and 5.4 < 'their 5.5' ≤ 5.6* *Allow width of rectangle to be 2.8 ≤ width ≤ 3.2* *CAO*

5.(a) Correct cuboid	B2	Ignore orientation of cuboid. For B2, their cuboid must have edges of correct length along or parallel to the 3 directions usually associated with isometric paper (the two diagonals and the vertical). Award B1 for any one edge dealt with correctly for all its three visible occurrences in a cuboid. For any mark to be awarded the line must go 'through the dots' AND have both ends 'on a dot'. Ignore attempt at handling 'hidden lines'. If no marks, award SC1 for a correct 'isometric' cuboid drawn with dimensions 6cm by 4cm by 2cm (counting dots) in any orientation.

5.(b)	(Volume =) $7 \times 5 \times 3$	M1	M1 must be for a complete correct method. e.g. any further manipulation to $7 \times 5 \times 3$ is M0.
	$= 105$	A1	CAO An unsupported final answer of 105 is awarded M1A1U0.
	cm^3	U1	Independent of other marks (e.g. M0 could have been previously awarded or no volume given). An unsupported answer of $105cm^3$ is awarded

10(a)(i) (Total length =) $\sqrt{500} + \sqrt{80}$ $= 10\sqrt{5} + 4\sqrt{5}$ OR $5\sqrt{20} + 2\sqrt{20}$ $= 14\sqrt{5}$ (m)	M1 m1 A1	If no marks awarded, SC1 for sight of $10\sqrt{5}$ or $5\sqrt{20}$ AND $4\sqrt{5}$ or $2\sqrt{20}$
10(a)(ii) (Area of triangle =) e.g. $\frac{(10\sqrt{5} - 4\sqrt{5}) \times 4\sqrt{5}}{2}$ or $\frac{(5\sqrt{20} - 2\sqrt{20}) \times 2\sqrt{20}}{2}$ or $\frac{\sqrt{40000} - \sqrt{6400}}{2}$ or $\frac{200 - 80}{2}$ $= 60$ (m^2)	M1 A1	FT the simplification of 'their $\sqrt{500}$' and 'their $\sqrt{80}$' provided they are surds For a step of simplification of $\frac{(\sqrt{500} - \sqrt{80}) \times \sqrt{80}}{2}$ Accept a mixture of the terms shown CAO
10(a)(ii) Alternative method 1: *(Using half of (bottom rectangle – square))* *(Area of triangle =)* *e.g.* $\frac{10\sqrt{5} \times 4\sqrt{5} - 80}{2}$ *or* $\frac{5\sqrt{20} \times 2\sqrt{20} - 80}{2}$ *or* $\frac{200 - 80}{2}$ $= 60$ (m^2)	*M1* *A1*	*FT the simplification of 'their $\sqrt{500}$' and 'their $\sqrt{80}$' provided they are surds* *Accept a mixture of the terms shown* *CAO*
10(a)(ii) Alternative method 2: *(Using the bottom trapezium)* *(Area of triangle =)* *e.g.* $\frac{(10\sqrt{5} + 4\sqrt{5}) \times 4\sqrt{5}}{2} - 80$ *or* $\frac{(5\sqrt{20} + 2\sqrt{20}) \times 2\sqrt{20}}{2} - 80$ *or* $\frac{(\sqrt{40000} + \sqrt{6400}) - 80}{2}$ *or* $\frac{200 + 80 - 80}{2}$ $= 60$ (m^2)	*M1* *A1*	*Or equivalent* *FT the simplification of 'their $\sqrt{500}$' and 'their $\sqrt{80}$' provided they are surds* *For a step of simplification of* $\frac{(\sqrt{500} + \sqrt{80}) \times \sqrt{80} - 80}{2}$ *Accept a mixture of the terms shown* *CAO*
10(b) Correct use of Pythagoras in 1 of the planes $\left(\frac{6{\cdot}5 - 4{\cdot}5}{2}\right)^2 + (4{\cdot}3 - 2{\cdot}3)^2$ or $1^2 + 2^2$ OR $(4{\cdot}3 - 2{\cdot}3)^2 + 3^2$ or $2^2 + 3^2$ OR $\left(\frac{6{\cdot}5 - 4{\cdot}5}{2}\right)^2 + 3^2$ or $1^2 + 3^2$ (AB =) $\sqrt{\left(\frac{6{\cdot}5 - 4{\cdot}5}{2}\right)^2 + (4{\cdot}3 - 2{\cdot}3)^2 + 3^2}$ or $\sqrt{1^2 + 2^2 + 3^2}$ $= \sqrt{14}$ (m)	M1 M2 A1	Or the square roots of these expressions May be embedded in further working May be seen as 2 applications of Pythagoras M1 for $\left(\frac{6{\cdot}5 - 4{\cdot}5}{2}\right)^2 + (4{\cdot}3 - 2{\cdot}3)^2 + 3^2$ or $1^2 + 2^2 + 3^2$ ISW

12(a) 2.425 m	B1	

12(b)(i) Sight of 2.595 (m) or equivalent in cm or mm	B1	Award B1 for sight of 4 × 0.005 in an appropriate calculation Allow 0.004999(....) for 0.005, must clearly be a recurring 9 digit
4 × 2.595 or 4 × 2.59 + 4 × 0.005 (= 10.36 + 0.02) or equivalent	M1	Or equivalent in cm or mm If B0, FT provided unambiguously chosen: FT 2.59 < 'their 2.595' ≤ 2.6
10.38(0 m)	A1	CAO, must be given in metres
12(b)(ii) 	B1	**Intention** to show 8 equal containers. Allow if: • there is very small gap (≈1mm) is shown between each of the containers • rectangles are not quite all the same size • a couple of the rectangles appear to be closer to squares • drawn free hand Do not accept if: • rectangles are shown as all squares • rectangles with shorter sides joined, e.g.  B0 for an 8 by 4 grid of squares or rectangles drawn
12(c) Complete method to calculate the percentage increase • $\frac{1.2 \times 10^8 - 2 \times 10^7}{2 \times 10^7}$ (× 100) • 5 (× 100) • $\frac{1.2 \times 10^8}{2 \times 10^7}$ (× 100) – 1(× 100) • 6 (× 100) – 1(× 100)	M2	<u>Allow place value errors in writing the given standard form numbers in full for M2 and M1 only</u> M1 for any one of the following calculations or evaluations: • $1.2 \times 10^8 - 2 \times 10^7$ (= 1×10^8 = 100 000 000) • $\frac{1.2 \times 10^8}{2 \times 10^7}$ (= 0.6 × 10 (× 100) or 6(× 100) or 600(%))
500 (%)	A1	CAO Answer space completing the statement takes precedence Accept equivalents 0.5×10^3 or 5×10^2 Accept an unsupported correct answer or a correct answer from reverse calculations