REVISE
.wales

3.24 — Box-and-whisker diagrams

Mark schemes for the 3.24 question pack

Spec 4.2.19 — Unit 3

SOLUTIONS · 2025 SPECIFICATION

Mark schemes for the 9 questions in the corresponding revise.wales question pack (31 marks total). Sources: legacy WJEC GCSE papers, WJEC SAM, and custom-authored mark schemes. Pack layout © revise.wales.

7(a) 14:30 to 14:45	B1	Accept any ¼ hour period within 14:27 to 14:57 inclusive Allow e.g. 2:30(p.m.) to 2:45(p.m.)
7(b) Answer in the range 15:09 to 15:15 inclusive	B1	Allow e.g. 3:09(p.m.) to 3:15(p.m.) inclusive
7(c) $\frac{18 \times 1000}{60 \times 60}$ 5 (metres per second)	M1 A1	Or equivalent e.g. $18 \times 5 \div 18$
7(d) ½ × 18 + ½ × 1 × (18 + 14) (= 9 + 16) 25 (km)	 M2 A1	Do not penalise a more accurate estimate that uses the velocities at 14:00, 15:00 and 16:00, e.g. using ½-hour intervals. M1 for one of the two areas correct in the sum, OR M1 for 1 slip in reading If a more accurate estimate used, M2 for a full correct method M1 for a full method with at least 1 correct area calculation A1 is dependent on M2 being awarded No FT from M1 *Alternative method:* *M2 for ½×1×((0+)14+2(18))* *Award M1 if 1 error made* *A1 for 25 (km) No FT from M1*

GCSE Mathematics – Numeracy Unit 1:Higher Tier Autumn 2016	Mark	Comment
7(e) Shows the distance travelled from the graph, e.g. ½ × 1 × 14 (= 7 km) or ½ × ½ × (14 + 12) + ½ × ½ × 12 (= 9.5 km)	M1	
Distance from the graph 7 (km) to 12 (km)	A1	If units are given they must be correct Must follow their working correctly
Shows use of 5 miles ≈ 8 km with a comparison conclusion, e.g. '7 km is reasonably close 8 km which is 5 miles', 'not really as 5 miles ≈ 8 km, so 9.5 km is a greater distance'	E1	Depends on M1 previously awarded Need sight of conversion 5 miles ≈ 8 km, or equivalent For this question, accept use of 3 miles is approximately 5 km
Organisation and communication	OC 1	*Organisation and communication* For OC1, candidates will be expected to: • present their response in a structured way • explain to the reader what they are doing at each step of their response • lay out their explanations and working in a way that is clear and logical • write a conclusion that draws together their results and explains what their answer means
Accuracy of writing	W1	*Accuracy of writing* For W1, candidates will be expected to: • show all their working • make few, if any, errors in spelling, punctuation and grammar • use correct mathematical form in their working • use appropriate terminology, units, etc.

6(a) April	B1	
6(b) January	B1	
6(c)(i) January and February	B1	In either order
6(c)(ii) 43	B1	
6(d) FALSE TRUE FALSE FALSE	B2	B1 for any 3 correct responses

5(a)(i) Orange pippin and 57 (mm)	B1	Accept 'orange' or 'pippin' as indication of the correct tree
5(a)(ii) 41 (mm)	B1	
5(a)(iii) Pink Lady and 33 (mm)	B2	B1 for any of the following: • Gala with 30 (mm) • Orange pippin 29 (mm) • Pink Lady with 79 – 46 • No apple indicated but IQR answer 33 (mm)
5(b) Gala selected with a reason e.g. '(highest) upper quartile', '25% over 80 mm' **OR** Pink Lady selected with a reason e.g. '(highest) median', 'half are over 63 mm'	 B1	Ignore units throughout Do not accept reasons based on range or IQR Do not ignore any additional statements of range, IQR, lower quartile Ignore an incorrect median stated for Pink Lady, e.g. 66mm, provided it is >61 and <67(mm)

6(a) Uniform scale from at least 5 (seconds) to at least 65 (seconds), **AND** time label Correct format of a box-and-whisker Showing least time 5 seconds Showing UQ 55 seconds Correct plotting upper end whisker at 65 seconds, LQ at 23 seconds AND median at 45 seconds	B1 B1 B1 B1 B1	Accept 'seconds' as the time label, do not accept if only attached to values on the scale Do not ignore additional lines drawn End stopper lines omitted can be ignored FT for unambiguous indications of the following: On the graph paper On the graph paper On the graph paper
6(b) 0.75 × 240 or equivalent 180 (text messages)	M1 A1	Allow sight of '75% of 240' If no marks, award SC1 for an answer of 60 (text messages)

= 480	A1	C.A.O. Allow 483 2 if 30·2 used.
6.(a) 0·32	B1	
6.(b) Sample number from Anglesey on 2nd day = 3000 × 0·42	M1	
= 1260	A1	Allow M1A1 for sight of 1260 e.g. 1260/3000
(Rel.Fqu. for two days =) $\frac{640 + 1260}{2000 + 3000}$	M1	FT 'their 1260'.
= 0·38	A1	
6.(c) 'Answer to part (b)' noted AND Valid explanation e.g. 'more people sampled'	E1	Explanation must refer to the sample being the largest. Allow e.g 'from both days', 'number of people added', 'frequencies are added'. Do not accept 'relative frequencies are added'.

3(a) Whiskers at 3 m and 22 m	B1	Ignore if lines omitted from the ends of the whiskers Must be the least and greatest values shown
Unambiguous values or box with LQ 5 m and UQ 20 m	B1	May be seen in working, must be clearly LQ and UQ Check cumulative frequency diagram If not clearly labelled in working or on the graph, they must be no other values given between • the least and the LQ, and • the greatest and the UQ
Median at 15 m	B1	May be seen in working, must be clearly the median Check cumulative frequency diagram If not an unambiguous unique line or point, i.e. not clearly labelled in working or on the graph, allow for a line (or point) indicated that is not the least or greatest value shown Only if B1 B1 B1 awarded, <u>penalise -1</u> if a correct format for a box-and-whisker diagram is not shown
3(b)(i) 0.75 × 68 or equivalent 51 (yachts)	M1 A1	Answer space takes precedence If no marks, award SC1 for sight of 17 (from 0.25 × 68)
3(b)(ii) Conclusion 'Eog' with sight of (Eog IQR 20 – 5 =) 15 (m) AND (Clwyd IQR 18 – 10 =) 8 (m)	B2	FT 'their UQ – LQ' from (a) box-and–whisker diagram B1 for either IQR correct
3(b)(iii) Conclusion 'Can't tell' with reason, e.g. 'only know that 25% of yachts in Clwyd Marina are greater than 18m' 'we don't know if any of the yachts in Clwyd Marina are greater than 22(metres, the longest in Eog Marina)' 'we don't know if a yacht in Clwyd Marina is greater than 22(metres)' 'it doesn't say maximum length of Clwyd Marina's results'	E1	Ignore any additional incorrect or spurious statements Allow 'Can't tell' with a reason, e.g. 'no raw data' 'don't know this information' 'doesn't show anywhere the biggest yacht in Clwyd Marina' 'we are only given some of the lengths of the yachts in the marinas' 'doesn't show Clwyd Marina's results' 'not specified' 'not specific' 'range not given for the Clwyd Marina (so can't identify the longest yacht)' Do not accept, e.g. 'don't know how many yachts in the marinas' 'not mentioned for either marina'

5(a)(i) King Edward and 90(g)	B1	
5(a)(ii) (90 – 52 =) 38(g)	B2	Do not award from sight of any incorrect working B1 for sight of any of the following: • 52 **and** 90 • Sight of 90 and 50 < 'their lowest mass' ≤ 54 **and** 90 – 'their lowest mass' correctly evaluated • Answer of 35(g) **and** unambiguous selection of ○ (King Edward) 98 and 63 or ○ (Desiree) 88 and 53
5(b) Selects: Desiree, **and** Interquartile range **and** less than for the other 2 varieties	E1	

9(a) 5 $\times \frac{240}{100}$ or $\times 2.4$ or equivalent	M1	<u>A table method altering all 3 in the same manner at the same time is M0</u> M marks may be seen in either order e.g. <u>Time</u> <u>Houses</u> <u>Vans</u> 4 240 12
$\times \frac{4}{3}$ or $\times 1.333\ldots$ or equivalent	M1	FT from M0 previously awarded Must be from use of 5 e.g. if this calculation is performed first <u>Time</u> <u>Houses</u> <u>Vans</u> 3 100 6.66…
= 16 (delivery vans)	A1	CAO

Unit 1: Higher Tier	Mark	Comments
4(a)(i) 200 – 80 or 90 + 30 120 (customers)	M1 A1	
4(a)(ii) 32 seconds	B1	
4(a)(iii) $\frac{200-170}{200}$ or $\frac{30}{200}$ or $\frac{15}{100}$ $\frac{3}{20}$	M1 A1	Award M1 for 0.15 or 15% Only ignore further working if written as 0.15 or 15% If no marks, award SC1 for an answer of $\frac{17}{20}$ (from 40 seconds or less)
4(b)(i) 36	B1	
4(b)(ii) 46 – 20 26	M1 A1	Allow 20 – 46
4(c) 'No' unambiguously stated or implied AND a reason, e.g. 'upper quartile is higher this year' '75% reading higher this year' 'interval was 37 (or 38) to 50 seconds last year, this year it is 46 to 50 seconds'	E1	Do not ignore incorrect values for the upper quartiles given, E0 if 'upper quartile' or '75%' stated with incorrect upper quartile readings Allow 'No' with a reason, e.g. '(last year) 38, (this year) 46' '(last year) 37.(…), (this year) 46' Do not accept, e.g. 'range greater this year' 'lower quartile is lower this year' 'median higher this year' 'customers still waiting at 50 seconds'

6(a) 76 (g)	B1	Answer space takes precedence
6(b) 3 × 400 × 25 ÷ 100 or ¾ × 400 or equivalent 300 (little gulls)	M1 A1	If no marks, award SC1 for (¼ × 400 =) 100 (gulls)
6(c) 25(%)	B1	Answer space takes precedence
6(d)(i) Slender(-billed gulls)	B1	
6(d)(ii) Lower quartile	B1	Strictly depends on B1 previously awarded in (d)(i)

End of solutions