REVISE
.wales

F3.11 — Mean, median, mode & range — lists & ungrouped data

Mark schemes for the F3.11 question pack

Spec 4.2.8, 4.2.10 — Unit 3

SOLUTIONS · 2025 SPECIFICATION

Mark schemes for the 35 questions in the corresponding revise.wales question pack (90 marks total). Sources: legacy WJEC GCSE papers, WJEC SAM, and custom-authored mark schemes. Pack layout © revise.wales.

			'3 × n + 7 = 3n + 7' is B1 – 1 = B0.
5. 8, 15 and 16 OR 9, 13 and 17		B2	All three numbers must be less than 25. B1 for three numbers with a range of 8. B1 for three numbers whose total = 39.

16.	8, 15 and 16 OR 9, 13 and 17	B2	All three numbers must be less than 25. B1 for three numbers with a range of 8.

4.(a) (i) 22 (cm)	B1	
4.(a) (ii) 18 cm^2	B1 U1	
4.(b) Rectangle 3 × 6	B1	Accept any rectangle with an area of 18 cm^2 which fits on the grid e.g. 4 × 4.5 FT 'their (a)(ii)'

3.(a) Sum of numbers (225) Sum of numbers / 9 25	M1 m1 A1	Allow for an unsupported value between 192 and 258 inclusive. Award this m1 for 'their sum' ÷ 9 CAO
3.(b) Correct explanation e.g. Neil hasn't written the numbers in (ascending or descending) order.	E1	

			Mark final answer.
4.	3 AND 11	B2	Accept in any order. B1 for two numbers with a sum of 14 OR B1 for two numbers with a range of 8. Accept non-integers for B1 marks

10.(a) 1, 4 and 25	B3	Answer space takes precedence. Accept 1^2, 2^2 and 5^2. B2 for writing three numbers which add to 30, two of which are square (e.g. 16, 9, 5). B1 for writing three numbers: • at least two of which are square, OR • which add to 30, one of which is square, OR • which are all square. SC2 for an answer of 1, 2 and 5 with correct working. SC1 for an unsupported answer of 1, 2 and 5
10.(b) 1, 5, 7, 7 OR 3, 5, 7, 7	B3	Answer space takes precedence. B2 for writing four odd and positive numbers (not 7, 7, 7, 7) which fulfil one of the conditions: • the mode of the numbers is 7 • the median of the numbers is 6 OR for an answer which satisfies both conditions but includes an even number (e.g. 2, 5, 7, 7) B1 for writing four numbers which fulfil only one of the conditions: • the mode of the numbers is 7 • the median of the numbers is 6 OR for an answer of 7, 7, 7, 7.
11.(a) $0{\cdot}125 \times 1176$ or equivalent. $= 147$ ISW	M1 A1	
11.(b) $4{\cdot}7$	B2	If further incorrect work shown e.g. '$4{\cdot}7 = 5$' then allow B1 only. B1 for sight of $4{\cdot}6$ or $4{\cdot}68(\ldots..)$ or $4{\cdot}70$
12. $f = 73(°)$ $g = 128 - 73$ $= 55(°)$	B1 M1 A1	F.T. 128 − 'their f'.
Alternative method $f = 73(°)$ $g = 180 - (180 - 128) - 73$ $= 55(°)$	*B1* *M1* *A1*	*FT 'their f'.*
13. (1) **5** (9) (7) (8) **2** **9** (4) (1)	B3	B1 for each. No F.T.
14.(a) $\frac{1}{12}$	B1	
14.(b) D	B1	
14.(c) $\frac{1}{3}$	B1	
15. Sight of 6·25 (hrs) OR 375 (min) (Planning =) $\frac{2}{5} \times 6{\cdot}25$ OR $\frac{2}{5} \times 375$ $= 2{\cdot}5$ (hrs) OR 150 (min) (Remainder of work = $6{\cdot}25 - 2{\cdot}5$ OR $375 - 150$ =) 3·75 (hrs) OR 225 (min) = 3 hours 45 minutes	B1 M1 A1 B1 B1	F.T. 'their time' in hours or in minutes. May be seen in parts (1/5th and then 2/5ths) [Note: $2/5 \times 6{\cdot}15$ OR $2/5 \times 615$ is B0M1(FT) $= 2{\cdot}46$(hrs) OR 246(min) A1(FT) BUT A0 if 2·46 then used as 2h 46m] F.T. 'their derived times' using same units. F.T. correct conversion of 'their times', correct to the nearest minute (rounded or truncated), if of equivalent difficulty. Allow unambiguous indication of units.

14.	3 AND 11	B2	Accept in any order. B1 for two numbers with a sum of 14 OR B1 for two numbers with a range of 8. Accept non-integers for B1 marks.

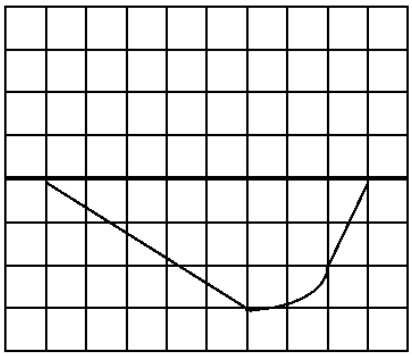
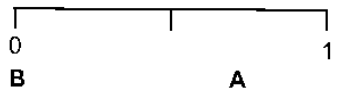
WJEC GCSE MATHEMATICS

AUTUMN 2020 MARK SCHEME

	GCSE MATHEMATICS **Unit 2: Foundation Tier**	**Mark**	**Comments**
1.	1.98 53 5.88 0.41	B1 B1 B1 B1	Ignore spurious units
2.(a)	3 700 000	B1	
2.(b)	9998	B1	
2.(c)	1, 3, 5 and 15	B2	Ignore repeats. Allow 1×15 and 3×5. B1 for 2 correct factors with none incorrect, OR for 3 or 4 correct with no more than one incorrect.
3.(a)	unlikely	B1	
3.(b)	20	B1	
3.(c)	Rolling a 1 on the dice	B1	
4.(a)		B2	B1 for two correct lines with one incorrect line OR for one correct line with no incorrect lines.
4.(b)	(an) equilateral (triangle)	B1	
5.(a)	102 OR 120	B1	
5.(b)	201 OR 210	B1	
6.	Three different even numbers with a sum of 24, not including 8. Possible solutions are 2, 4 (and) 18 2, 6 (and) 16 2, 10 (and) 12 4, 6 (and) 14	B3	In any order. Allow inclusion of negative numbers. If B3 not awarded, award B2 for three numbers which sum to 24 which satisfy two of the three conditions: • The numbers are different • The numbers are even • None of the numbers is 8 If B2 not awarded, award B1 for three numbers which sum to 24.
7.(a)	0.12 or $\frac{3}{25}$. or equivalent	B1	
7.(b)	$\frac{3}{5} \times 632$ or equivalent = 379.2	M1 A1	Award M1 A0 for 1896/5 or $379\frac{1}{5}$.
7.(c)	2.5	B1	
8.	$\frac{3}{10}$ 30 $\frac{9}{(20)}$ 0.45	B1 B1 B1 B1	Accept 30/100 for 3/10

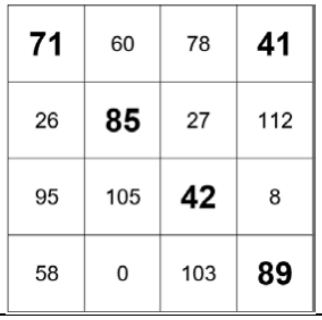
WJEC GCSE MATHEMATICS

AUTUMN 2021 MARK SCHEME

Unit 1: Foundation Tier	Mark	Comments
1.(a) Ninety-five thousand and forty-eight	B1	
1.(b) 931	B1	
1.(c) 1250	B1	
1.(d) 208	B1	
1.(e) 1,2,3,6,9,18	B2	B1 for 4 or 5 correct and 0 incorrect B1 for 5 or 6 correct and 1 incorrect Ignore repeated numbers Accept products 1×18, 2×9, 3×6
2.(a) 94 (mm)	B1	Accept 92 to 96 (mm)
2.(b) 136(°)	B1	Accept 134 to 138 (°)
3.(a) 16	B1	
3.(b) ¾	B1	Mark final answer.
3.(c) 28	B1	
4. 	B2	B1 for correct longer straight line. B1 for correct curve AND shorter straight line. The lines must pass through the correct points.
5.(a) 4.3 x 1000 4300 (g)	M1 A1	
5.(b) 3 × 100 ÷ 6 50 (cm)	M1 A1	If M0 A0, award SC1 for sight of 300(cm) or 0.5(m).
6. 	B1 B1	A should be between 0.6 and 0.8 B should be at 0

WJEC GCSE MATHEMATICS

AUTUMN 2021 MARK SCHEME

Unit 2: Foundation Tier	Mark	Comments
1.(a) 5169	B1	
1.(b) 6502	B1	
1.(c) 186	B1	
1.(d) 45	B1	
2.(a) 5, 5, 5, 5	B1	
2.(b) Exactly two 3s and any other two numbers	B1	Accept in any order.
2.(c) Exactly one 2 and any other three numbers	B1	Accept in any order.
3.(a) 40 065	B1	
3.(b) 5400	B1	
4.(a) rhombus	B1	
4.(b) equilateral triangle	B1	
5. 	B3	B2 for 3 rows or 3 columns with a total of 250. B1 for 1 or 2 rows or 1 or 2 columns with a total of 250.
6.(a) 98	B1	
6.(b) Subtract 13 (from the previous term)	B1	Accept -13, goes down in 13s, etc.
6.(c) x-2 (years old)	B1	Mark final answer.
7.(a) Sum of numbers (262) Sum of numbers ÷ 4 65.5 or equivalent	M1 m1 A1	Allow for an unsupported value between 173 and 351. Award this m1 for 'their sum' ÷ 4 CAO. Allow 131/2. If no marks awarded, allow SC1 for (64 + 89 + 83 + 26 ÷ 4 =) 242.5 or equivalent.
7.(b) (65.5 + 1 =) 66.5	B1	F.T. 'their mean' from (a). Allow 133/2.
8.(a) 23.04	B1	Accept $23\ ^{1}/_{25}$ or equivalent e.g. 576/25
8.(b) 7.9	B1	Accept $7\ ^{9}/_{10}$ or equivalent e.g. 79/10
8.(c) 0.04 × 325 or equivalent = 13 ISW	M1 A1	
9. (Oliver's number is) 90	B3	B2 for a final answer between 40 and 95 satisfying 2 of the 3 conditions. (45, 54, 60, 72) B1 for a final answer between 40 and 95 satisfying only 1 of the 3 conditions. (40, 42, 44, 46, 48, 50, 52, 56, 58, 62, 63, 64, 66, 68, 70, 74, 75, 76, 78, 80, 81, 82, 84, 86, 88, 92, 94)
OC Organisation and Communication.	OC1	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 explanation and working in a way that is clear and logical • write a conclusion that draws together their results and explains what their answer means

14. Sight of 9 AND 49 n + 9 = 49 (n =) 40	B1 M1 A1	 Any unambiguous indication that this linear relationship is being considered (including 'trial and improvement'). FT their $\sqrt{81}$ (≠81) AND 7^2 (≠7) for M1 and possibly A1 if at least one correct value used. FT for M1 only if neither correct value used. Award M1 if 49 – 9 seen. Mark final answer.
15. Indicates 2 (letters out of 6 gain points) (Expected number of wins =) $\frac{2}{6} \times 24$ or equivalent = 8 (Points gained =) 8 × 10 = 80 (points) AND 'No' (Leah is not expected score 100 points)	B1 M1 A1 M1 A1	Any unambiguous indication. FT 'their stated number of '10 point' letters'. Award M1A1 for 8/24 suggesting '8 wins out of 24' FT 'their derived 8' × 10 only if 'their derived 8' < 24. FT their derived number of points
Alternative method 1 *Indicates 2 (letters out of 6 gain points)* *(Each letter expected to be drawn) $\frac{24}{6}$ (times)* *= 4 (times)* *(Points gained =) 4 × 2 × 10* *= 80 (points) AND* *'No' (Leah is not expected score 100 points)*	*B1* *M1* *A1* *M1* *A1*	*Any unambiguous indication.* *FT 'their derived 4' and 'their stated 2'.* *FT their derived number of points.*
Alternative method 2 *Indicates 2 (letters out of 6 gain points)* *(Expected number of wins =) $\frac{2}{6} \times 24$ or equivalent* *= 8* *(Number of wins required =) $\frac{100}{10}$* *= 10 (wins) AND* *'No' (Leah is not expected score 100 points)*	*B1* *M1* *A1* *M1* *A1*	*Any unambiguous indication.* *FT 'their stated number of '10 point' letters'.* *Award M1A1 for 8/24 suggesting '8 wins out of 24'* *FT their derived number of expected wins.* *Note for Alternative method 2* *If 'number of wins required' is calculated before calculating 'number of expected wins' then the conclusion ('AND') will be attached to the 8 rather than the 10.*
16. 4x + 5 = 57 or equivalent 4x = 52 x = 13	M1 A1 A1	 FT from 4x = k. Accept x = k/4 (but, if on FT k is a multiple of 4, final answer must be given as a whole number.) M1A1A0 for 'x = 52/4' Mark final answer. Allow (M1)A1A1 for a correct embedded answer BUT only (M1)A1A0 if contradicted by x ≠ 13.
17. 3, 4, 4, 9 OR 3, 3, 5, 9.	B3	B1 for a range = 6. B1 for a total = 20. B1 for a median = 4. Penalise use of negative or non-integer values −1. FOUR numbers must be shown, otherwise B0.
18. Use of Distance / Time $\frac{100}{2{\cdot}5}$ or equivalent = 40 (mph)	M1 M1 A1	Allow M1 even for e.g. 100 / 2·3(0) or 100/150. C.A.O.

9. 7, 7, 10, 12 (in any order)	B3	*Numbers shown **in** number boxes take precedence.* The four conditions: • All numbers between 1 and 15 inclusive. • **Unique** mode = 7. • Median = 8·5. • Total = 36. B2 for three conditions met. B1 for two conditions met. FOUR numbers must be shown, otherwise B0. Award B1 only for 7, 7,10,10 OR 7, 7,11,11 (not a unique mode).

4. (Total cost of small boxes = 7 × 5 =) (£)35	B1	
(Total cost of large boxes = 59 – 35 =) (£)24	B1	FT 'their stated or derived 35'
(Cost of one large box = 24 ÷ 3 =) (£)8	B1	FT 'their stated or derived 24', provided ≠ 59 Accept follow-through answers rounded or truncated to the nearest pound, or more accurate.
Organisation and Communication.	OC1	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 explanation 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	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

5(a) (Tax at 22%) 0.22 × 15000 or 0.22 × (25000 – 10000) or equivalent	M2	Ignore £ for € throughout M1 for appropriate sight of 25000 – 10000 (= €15000)
(Tax at 35%) 0.35 × 3000 or 0.35 × (28000 – 25000) or equivalent	M2	M1 for 28000 – 25000 (= €3000)
(Total tax due 3300 + 1050 =) 4350 (euros)	A2	CAO A1 for sight of 3300 (euros) or 1050 (euros)
(Tax still owed 4350 – 3600 =) 750 (euros)	B1	FT for positive answers only, 'their derived 4350' – 3600, provided 3300 + ... or ... + 1050 seen, i.e. sum of two amounts with at least one amount correct <u>If no marks, for special cases award one of the following:</u> (0.22 × (28000 – 3600 – 10000) =) (0.22 × (24400 – 10000) =) (0.22 × 14400 =) (€) 3168 — SC2 0.22 × (28000 – 3600 – 10000) or 0.22 × (24400 – 10000) or 0.22 × 14400 — SC1
5(b) 3600 ÷ 1.11 (£) 3243.24	M1 A1	Answer space takes precedence Sight of (£) 3243 or 3243.2(4324....) implies M1

8.	(value of 6th number =) $6 \times 8{\cdot}5 - 5 \times 7$ $= (51 - 35)$ (=) 16	M2 A1	Award M1 for sight of any one of the following: • 5×7 • 35 • $6 \times 8{\cdot}5$ • 51. CAO

18. (value of 6th number =) $6 \times 8{\cdot}5 - 5 \times 7$ $= (51 - 35)$ (=) 16	M2 A1	Award M1 for sight of any one of the following • 5×7 • 35 • $6 \times 8{\cdot}5$ • 51 CAO
19. (1 share =) (£)16.80 ÷ 8 or equivalent (1 share =) (£)2.1(0) or equivalent (Total =) (£)18.9(0) or equivalent	 M1 A1 A1	*Allow answers in pounds or pence.* Award M1 A1 for sight of (£)2.1(0) : (£)16.80. If M1 A0, then FT 'their (£)2.1(0)' × 9 OR 'their (£)2.1(0)' + (£)16.8(0) If units given, then they must be correct e.g. award A1 for 1890 or 1890p but A0 for £1890
Alternative method:		

5. $2(n-7)$ or equivalent e.g. $2n-14$.	B3	Answer space takes precedence. For B3, accept as a final answer of: • $2\times(n-7)$ • $(n-7)2$ • $(n-7)\times 2$. Award B2 if incorrect subsequent working for one of the above. Award B2 for sight of one of the following: **missing brackets** • $2\times n-7$ • $n-7\times 2$ **error in Samir's age** • $2(n+7)$ • $2\times(n+7)$ • $(n+7)2$ • $(n+7)\times 2$ • $2(7-n)$ • $2\times(7-n)$ • $(7-n)2$ • $(7-n)\times 2$ • $2n+14$ • $14-2n$ Award B1 for sight of one of the following: • $n-7$ • $2\times n+7$ • $n+7\times 2$ • $2\times 7-n$ • $7-n\ \times 2$ • $2n-7$ • $n-14$ • $n-72$. Allow use of a different letter for n.

4.(c) parallelogram	B1	
5. 11 13 15 17 20 22 29 or 29 22 20 17 15 13 11 (Median =) 17	M1 A1	For arranging the 7 numbers in ascending or descending order

16.(a)	28	B1	Allow B1 for a correct embedded answer (e.g. 28 ÷ 4 = 7 BUT B0 if contradicted by total ≠ 28). Allow the sequence 7,14,21,28 for B1, but only if no further numbers are shown.

16.(b) Four numbers (in any order) with a total of 28 and range of 6 e.g. 3 7 9 9 3 8 8 9 4 7 7 10 4 6 8 10 4 5 9 10 4 4 10 10 5 5 7 11 5 6 6 11	B2	Numbers may be seen in any order. Accept answers using fractions and decimals. FT 'their total' from 16(a). Award B1 for **four** numbers with one of the following: • total = 28 • total = 'their total' from 16(a) • range = 6.

<table>
<tr><td>5.(a) 36</td><td>B1</td><td>Allow B1 for a correct embedded answer
(e.g. 36 ÷ 4 = 9 BUT B0 if contradicted by total ≠ 36).

Allow the sequence 9, 18, 27, 36 for B1, but only if no further numbers are shown.</td></tr>
<tr><td>5.(b) Four numbers including 11, 11 AND a pair of non-identical numbers whose sum is 14

<table><tr><td>1</td><td>13</td><td>11</td><td>11</td></tr><tr><td>2</td><td>12</td><td>11</td><td>11</td></tr><tr><td>3</td><td>11</td><td>11</td><td>11</td></tr><tr><td>4</td><td>10</td><td>11</td><td>11</td></tr><tr><td>5</td><td>9</td><td>11</td><td>11</td></tr><tr><td>6</td><td>8</td><td>11</td><td>11</td></tr></table></td><td>B2</td><td>Numbers may be seen in any order.
Accept answers using fractions, decimals or negative numbers.

FT 11, 11 AND two numbers whose sum is ‘their total’ from (a) – 22 for a possible B2 or B1.

Award B1 for four numbers with one of the following:
• total = 36
• total = ‘their total’ from 5(a)
• four numbers with a unique mode of 11 (11, 11, ?, ? or 11, 11, 11, ? or 11, 11, 11, 11)
• 7, 7, 11, 11.</td></tr>
</table>

point C.		
5.(a) 3	B1	
5. (b) 4	B2	B1 for 1 2 3 4 8 8 9 (ascending or descending list)
5.(c) (Missing value =) 5 × 3 – (7 + 2) (Missing value = 15 – 9 =) 6	M2 A1	Award M2 for sight of unambiguous 15 – 9 Award M1 for sight of (Total of all 3 values =) 5 × 3 or unambiguous '15' CAO
5.(c) Alternative method (trial and improvement) *A trial of any value* *An improved trial* *6*	*M1* *m1* *A1*	*'Their value' + 7 + 2 evaluated correctly* *3* *An improved trial means that their choice of value takes them in the right direction.* *May be seen as an embedded answer, unless contradicted. If contradicted award M1 m1 A0.* *Award M1 m1 A1 for a correct answer of 6.*

6(a)(i) Unambiguously indicates or states 'Yes' with a reason, e.g. 'both 25 kg to 35 kg', 'the highest frequencies at the same mass'	E1	*Ignore any additional spurious or contradictory statements provided 'Yes' selected* Allow 'Yes' with a reason, e.g. 'both at 30 kg', 'both at the same mass', 'both have the same mass', 'tallest (highest frequency) is 30 kg for both polygons' Do not accept 'Yes' with a reason, e.g. 'don't know', 'both in the same place', 'the groups have the same width', 'the graph tells us this'
6(a)(ii) Unambiguously indicates or states 'Can't tell' with a reason, e.g. 'there were 30 dogs with a masses between 15 kg and 25 kg', 'no raw data is given', 'the actual mass of each dog is not given', 'the data is grouped'	E1	*Ignore any additional spurious or contradictory statements provided 'Can't tell' selected* Allow 'Can't tell' with a reason, e.g. 'doesn't show this', 'you can't tell the exact number of dogs' 'doesn't give the amount of dogs' Do not accept 'Can't tell' with a reason, e.g. 'don't know', 'it is an estimate', 'it isn't accurate', 'because they can be anywhere from 10 kg to 20 kg'
6(a)(iii) Unambiguously indicates or states 'Correct' with a reason, e.g. 'Pencwm polygon shows a greater drop for greater masses', 'fewer dogs but more large dogs in Glanafon', 'more dogs in Pencwm, but fewer large dogs', 'about the same number of large dogs, with fewer dogs in Glanafon', 'about the same number of large dogs, with more dogs in Pencwm',	E1	*Ignore any additional spurious or contradictory statements provided 'Correct' selected* **Do not** allow a reason based on calculations of proportions **alone**, e.g. Pencwm 27.5%, Glanafon 41.6% Allow 'Correct' with a reason, e.g. 'Pencwm (polygon) shows a steeper drop from 30 kg', 'line for Pencwm is steeper (drop)', 'Glanafon (polygon) has a less steep drop for larger dogs', 'the greater masses are more frequent (in Glanafon)' '2 of the 3 points for Glanafon are above Pencwm', 'Pencwm line drops below Glanafon after 40 (kg)' Do not accept 'Correct' with a reason, e.g. '36 dogs in Pencwm and 37 dogs in Glanafon' alone without considering proportion, 'the greatest is 45 kg', 'higher frequency in Glanafon', 'Pencwm is bigger but doesn't have higher proportion' 'as seen by the skew in (the) Glanafon (polygon)', 'seen by the shape (of the polygon) for Glanafon'

6(b) (Total number of dogs 20 + 30 + 45 + 25 + 7 + 4 =) 131	B1	May be implied by the sight of ((20 + 30 + 45 + 25 + 7 + 4) ÷ 6 =) 21.8(33...)
10×20 + 20×30 + 30×45 + 40×25 + 50×7 + 60×4 (= 200 + 600 + 1350 + 1000 + 350 + 240) (= 3740)	M1	Ignore any additional products seen FT 'their midpoints' provided at least 5 are within or at the bounds of the relevant groups e.g. use of • lower bounds of each group gives 3085 • upper bounds of each group gives 4395
÷ 131	m1	FT an error in summing 20, 30, 45, 25, 7 and 4
(28.5(496.... kg) so) 3.95 (kg) (less)	A2	CAO ISW further rounding or truncation Allow 4 (kg) from correct working Accept (29 (kg) and) 3.5 (kg) from correct working Award A1 for any of the following as the final answer • 28.5(496.... kg) • 29 (kg) (from correct working) OR Award A1 on FT from M1 m1 previously awarded for a correct evaluation of 'their estimate mean' e.g. use of lower bounds gives (3085/131 =) 23.54…
6(b) Alternative MS if Glanafon's last 2 points used for possible award of B1 M1 m1 only *(Sight of 20 + 30 + 45 + 25 + 10 +7 =) 137*	*B1*	May be implied by the sight of ((20 + 30 + 45 + 25 + 10 + 7) ÷ 6 =) 22.8(33...)
10×20 + 20×30 + 30×45 + 40×25 + 50×10 + 60×7 *(= 200 + 600 + 1350 + 1000 + 500 + 420)* *(= 4070)*	*M1*	*Ignore any additional products seen* *FT 'their midpoints' provided at least 5 are within or at the bounds of the relevant groups* *e.g. use of* • *lower bounds of each group gives 3385* • *upper bounds of each group gives 4755*
÷ 137	*m1*	*FT an error in summing 20, 30, 45, 25, 10 and 7*

7(a) $5 \times 42 - (40 + 37 + 39 + 48)$ or $210 - 164$ or equivalent OR $40 + 37 + 39 + 48 + \ldots\ldots = 5 \times 42$ or $164 + \ldots = 210$	M2	May be shown in stages Allow missing brackets as the intention to subtract M1 for sight of any one of the following: • 5×42 or 210 (mm) • the idea that $(40 + 37 + 39 + 48 + x) \div 5 = \mathbf{42}$, where x may be a gap, variable or a trial
(Friday) 46 (mm)	A1	CAO. Do not award from incorrect working Answer space takes precedence Do not allow an embedded answer
7(a) Alternative methods *(Difference from mean) 42 + 2 + 5 + 3 – 6* *OR* *(Contributions to the mean each day)* $5 \times (42 - \frac{40}{5} - \frac{37}{5} - \frac{39}{5} - \frac{48}{5})$ *or equivalent* *(= 5 × 9.2)*	*M2*	*M1 for* $42 - \frac{40}{5} - \frac{37}{5} - \frac{39}{5} - \frac{48}{5}$
(Friday) 46 (mm)	*A1*	*CAO. Answer space takes precedence*

7(b) $5 \times 42 \div 7$ or $210 \div 7$		M1	Allow 'their 46' from (a) has been truncated or rounded, FT any of the following: • 'their 5×42' $\div 7$ • ('their $40 + 37 + 39 + 48$' + 'their 46') $\div 7$ • $(164 +$ 'their 46'$) \div 7$
	30 (mm)	A1	Answer space takes precedence On FT, accept rounded or truncated answers provided working is shown

9. (Amount of tea in full cup =) (44 ÷ 2) × 7 or equivalent = 154 (ml)	M1 A1	M1 for full complete method. May be seen in stages. If M0 awarded, award SC1 for one of the following: • appropriate sight of 22 • final answer of 61·6(ml) (from (44 ÷ 5) × 7).
9. Alternative method *(Amount of tea in full cup =)* *(44 ÷ 2) × 5 + 44* *= 154 (ml)*	*M1* *A1*	*M1 for full complete method.* *May be seen in stages.* *If M0 awarded, award SC1 for appropriate sight of 22.*

9. $2500 \times (1 - 0.23) \times (1 - 0.04)^{39} \times (1 + 0.14)^{10}$ or $2500 \times 0.77 \times 0.96^{39} \times 1.14^{10}$ or equivalent	M3	May be seen in stages M2 for a product with any 3 correct terms OR M1 for a product with any 2 correct terms
(£) 1452(.30)	A1	CAO, ignore premature rounding in working provided answer is (£) 1452.(…), allow rounded to (£)1450 from correct working

15.(a) 36	B1	Allow B1 for a correct embedded answer (e.g. 36 ÷ 4 = 9 BUT B0 if contradicted by total ≠ 36). Allow the sequence 9, 18, 27, 36 for B1, but only if no further numbers are shown.
15.(b) **Four** numbers including 11, 11 AND a pair of non-identical numbers whose sum is 14 **1 13 11 11** **2 12 11 11** **3 11 11 11** **4 10 11 11** **5 9 11 11** **6 8 11 11**	B2	Numbers may be seen in any order. Accept answers using fractions, decimals or negative numbers. FT 11, 11 AND two numbers whose sum is 'their total' from (a) – 22 for a possible B2 or B1. Award B1 for **four** numbers with one of the following: • total = 36 • total = 'their total' from 5(a) • four numbers with a unique mode of 11 (11, 11, ?, ? or 11, 11, 11, ? or 11, 11, 11, 11) • 7, 7, 11, 11.

Unit 2: Foundation Tier	Mark	Comments
7.(a) A correct explanation, e.g. • 'She hasn't used BIDMAS/ BODMAS/ Order of Operations'. • 'You must multiply before you add' • 'She should have multiplied first' • 'She has added the 10 and the 4 first, then multiplied by 9'	E1	Accept '10 + 36 = 46'. Award E0 for: • an unsupported 46. • '10 + 4 x 9 = 46'. • 'she added 10 and 4 together' • a correct explanation given but later contradicted • a correct explanation given with an incorrect answer to the calculation
7.(b) A correct explanation, e.g. • 'He has divided by 2 not divided by a half'. • 'He has worked out a half of 20 (not divided 20 by a half)'. • 'He should have multiplied by 2'. • 'He should have multiplied not divided'. • 'He should have divided by a half (not by 2)'	E1	Accept '20 ÷ ½ = 40' or '20 × 2 = 40'. Award E0 for: • a correct explanation given but later contradicted • an unsupported 40 • 'he shouldn't have divided by 2' • 'there are more than 10 halves in 20' • a correct explanation given with an incorrect answer to the calculation
7.(c) A correct explanation, e.g. • 'She hasn't calculated the difference between the biggest number and the smallest number'. • 'She should have done 20 – 1'	E1	Accept '20 - 1 = 19'. Allow: • 'range = largest – smallest' • 'she didn't put the numbers in order first (before finding the difference between the end numbers)' • '11 isn't the biggest number and 7 isn't the smallest number' Award E0 for: • an unsupported 19 • 1 – 20 (unless = 19 also seen) • '11 isn't the biggest number' • '7 isn't the smallest number' • 'smallest take away the biggest' • a correct explanation given but later contradicted. • a correct explanation given with an incorrect answer to the calculation
7.(d) A correct explanation, e.g. • 'They should halve (1/5 of the number to work out 1/10 of the number)'. • 'They should divide by 2'. 'They should multiply by 5 then divide by 10'	E1	Accept equivalent explanations.

Unit 2: Intermediate Tier	Mark	Comments
7(a) Method **not directly** working with a stated or omitted number of hours difference		Methods may be shown in stages or be embedded Use this method if 2 separate numbers of hours are used, which may not be correct, i.e. ≠12 and ≠10, with or without indication of subtraction Penalise every additional **spurious** term by reducing the count of correct terms by 1*
0.324 × 8 × **(10 or 12)** × 7 × 80 ÷ 1000	M3	Allow '× 32.4' for '× 0.324' M2 for any 4 or 5 correct terms* M1 for any 3 correct terms*
0.324 × 8 × **(12 or 10)** × 7 × 80 ÷ 1000 **with** the intention to subtract	m1	Must be an indication of the intention to subtract, in either order **FT from 5 (or 6) consistent correct terms** for use of • the other value 10 or 12 respectively • 'their number of hours' are 13 **and** 11 (incorrect) Award m0 if inconsistent, i.e. not an equal number of **consistent correct terms*** between the expressions. Mark 'their better stated calculation' first if both are given
(Saving is 17.418… – 14.515…=) (£) 2.90	A1	CAO All working must be checked, do not award 5 marks for £2.90 from incorrect working.
Alternative method: *Method **directly** working with a stated or omitted number of hours difference*		*Methods may be shown in stages or be embedded* *Use this method if a single number of hours is used, which may not be correct, i.e. ≠2, or if the number of hours is omitted* *Do not allow 2 hours as a correct term from incorrect working, e.g. 13 – 11 = 2* *Penalise every additional **spurious** term by reducing the count of correct terms by 1**
0.324 × 8 × 2 × 7 × 80 ÷ 1000	*M4*	*Allow '× 32.4' for '× 0.324'* *M3 for any 5 correct terms** *M2 for any 4 correct terms** *M1 for any 3 correct terms**
(Saving is) *(£) 2.90*	*A1*	*CAO* *All working must be checked, do not award 5 marks for £2.90 from incorrect working.*

Unit 2: Intermediate Tier	Mark	Comments
7(b) Height = $\tan 68° \times 3.3$ or height = $\frac{\sin 68° \times 3.3}{\sin(90-68)°}$	M2	Or alternative correct full method, isolating height M1 for $\tan 68° = \text{height} / 3.3$ or $\frac{\text{height}}{\sin 68°} = \frac{3.3}{\sin(90-68)°}$ or equivalent
8.167… (m) or 8.17 (m) or 8.2 (m)	A1	Allow 8(m), 8.1(m) 8.16(m) from correct working

Unit 1: Intermediate Tier	Mark	Comments
8(a)(i) 200 – 80 or 90 + 30 120 (customers)	M1 A1	
8(a)(ii) 32 seconds	B1	
8(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)
8(b)(i) 36	B1	
8(b)(ii) 46 – 20 26	M1 A1	Allow 20 – 46
8(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'

		B1 if only $(x=)-8$ AND $(x=)5$ seen. (B1)
18. $\frac{a+b}{2}=b-a$ $a+b=2(b-a)$ $a+b=2b-2a$ or $a+2a=2b-b$ $(=3a=b)$	B1 B1 B1	Award B0 for $a+b\div 2=b-a$ unless brackets are implied in later correct workings. May be implied by correct further work (e.g. $a+b=2b-2a$). Award final B1 only from convincing work. If no marks, award SC1 for one of the following: • $a+b\div 2=b-a$ • $\frac{a+b}{2}=a-b$ • sight of $\frac{a+b}{2}$ **AND** $b-a$ • showing the result is true (mean = range) for a pair of values a and b (where $3a=b$) e.g. stating that a = 3 and b = 9 and that (9 + 3) ÷ 2 = 6 and 9 – 3 = 6.
18. Alternative method: *Assuming* $b=3a$ *(Mean =)* $\frac{a+3a}{2}$ $=2a$ *Range =* $3a-a=2a$	*M1* *A1* *B1*	*Working must be shown.* *Working must be shown.*

		• sight of 152 (but not 152B)
9.(a) A correct explanation, e.g. • 'He didn't write the numbers in (ascending/ descending) order (before identifying the middle number)'. • 'The median is 11'. • '20 is the largest number'.	E1	Allow • 'because it's 11' • '20 is not the middle number' • a demonstration of how to correctly calculate the median e.g. circling the middle number in an ordered list. Do not accept '11' or 'the median is the middle'. Do not ignore contradictory or incorrect comments e.g. 'put them in order first. the median is 14'
9.(b)(i) Sum of numbers (339) Sum of numbers ÷ 5 67·8 or $\frac{339}{5}$ or equivalent	M1 m1 A1	Allow for an unsupported value between 250 and 428. Award this m1 for 'their sum' ÷ 5 CAO. ISW for candidates who go on to round their answer to 68. Do not allow 339 ÷ 5. If no marks, award either: • SC2 for an unsupported answer of 68 • SC1 for (59 + 89 + 77 + 31 + 83 ÷ 5 =) 272·6 or equivalent.
9.(b)(ii) (67·8 - 3 =) 64·8 or $\frac{324}{5}$	B1	F.T. 'their mean' from (a). Do not allow 324 ÷ 5.

11(a) 76 (g)	B1	Answer space takes precedence
11(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)
11(c) 25(%)	B1	Answer space takes precedence
11(d)(i) Slender(-billed gulls)	B1	
11(d)(ii) Lower quartile	B1	Strictly depends on B1 previously awarded in (d)(i)

		tins with 3, or their area with 4.8(m²) is given
11. (Electricity cost is) 654 × (£)0.30 (£)196.2(0) or 19620(p)	 M1 A1	Incorrect unit of money is penalised -1 once only on the first occurrence, by withholding an A or B mark Accept 654 × 30(p) If units are given they must be correct Accept £196.20p
(Cost of electricity and standing charge is £196.20 + 54 =) (£) 250.2(0)	B1	FT provided 654 used in a calculation for 'their cost of electricity' Do not accept if embedded with an incorrect interpretation of the standing charge, e.g. 196.20 + 3 × 54 = (£)358.20 is B0 If previous M0 A0 B0 for (654 × (£)0.30 × 3 =) £588.60 AND (588.60 + 54 × 3 = 588.60 + 162 =) £750.60, award SC1 for this consistent misunderstanding and then FT
(Total bill including VAT) 1.05 × 250.2(0) or 250.2(0) + 12.51	M1	FT from 'their derived total of electricity' + 'their standing charge', accept rounding or truncation to a penny Allow M1 A0 for 1.05 × 'their total rounded or truncated to a whole pound'
(£)262.71	A1	If M0 A0 for inclusive of VAT cost, allow SC1 for an answer of (£)262.70, provided not from incorrect working (allow from 250.20 + 12.50) If final B0 M0 A0, award SC1 for the correct evaluation of 1.05 × 'their derived cost of electricity' having not considered and omitted the standing charge, or previously subtracted the standing charge from 'their cost of electricity'

12. Five values that satisfy both conditions: • Total = 22·5 • **Unique mode** = 3·5 3·5 | 3·5 | 3 **different** values that total 15·5 3·5 | 3·5 | 3·5 | 2 values that total 12 3·5 | 3·5 | 3·5 | 3·5 | 8·5	B3	May be written in any order. Answer boxes take precedence. Award B2 for one of the following: • 5 values that total 22·5 • sight of 5 × 4·5 and 5 values with a unique mode of 3·5 • sight of 22·5 and 5 values with a unique mode of 3·5. Award B1 for one of the following: • sight of 5 × 4·5 • sight of 22·5 • 5 values with a unique mode of 3·5. If answer boxes are blank, the 5 values need to be clearly identified in the working space.

End of solutions