1			3	M1	for one of - 5 numbers with a median of 8 - 5 numbers with a mode of 5 - 5 numbers with a range of 10 - 5 numbers with a sum of 45
				M1	for two of - 5 numbers with a median of 8 - 5 numbers with a mode of 5 - 5 numbers with a range of 10 - 5 numbers with a sum of 45
		5, 5, 8, 12, 15		A1	Note: The numbers can be in any order
					Total 3 marks

2	15×24 (= 360) **or** 25×18 (= 450)		3	M1	may be implied by 810 seen
	$\frac{'360'+'450'}{40}$ $(=\frac{810}{40})$			M1	dep on M1
		20.25 oe		A1	for 20.25 accept 20.3 (allow 20 from correct working)
					Total 3 marks

3	$\frac{x+10}{2} = 9$ **or** $x = 8$		4	M1	(indep)
	$\frac{4+7+x+10+y+y}{6} = 11$ oe **or** '66' – 4 – 7 – 10 (= 45)			M1	where x may be a number $7 < x < 10$
	(y =) (6 × 11 – 4 – 7 – 10 – '8') ÷ 2			M1	ft their ft their value of x provided $7 < x < 10$ for a fully correct method
		$x = 8$ and $y = 18.5$ oe		A1	
					Total 4 marks

4	a			2	M1	for at least 2 correct tallies or frequencies
			2, 5, 4, 3, 2		A1	mark frequencies only – in either column
	b		1	1	B1	allow ft from (a)
	c		4	1	B1	
						Total 4 marks

5	a		$50 < L \leq 60$	1	B1	oe eg 50 - 60
	b	$25 \times 6 + 35 \times 26 + 45 \times 31 + 55 \times 40 + 65 \times 17$ (150 + 910 + 1395 + 2200 + 1105)(= 5760)			M2	For correct products using midpoints (allow one error) with intention to add. M1 for products using frequency and a consistent value within the range (allow one error) with intention to add or correct products using midpoints (allow one error) without addition
		"5760" ÷ "120"			M1	dep on M1
			48	4	A1	
						Total 5 marks

6	bi		4	1	B1	
	bii	−7, −6, −5, −1, 0, 4, 4			M1	for writing the values in the correct order, condone one error or omission **or** for an answer of 0
			−1	2	A1	

7	$n - 3 = 13$ oe or $n = 16$ or $(6 + m) \div 2 = 8.5$ oe or $m = 11$		2	M1	
		$n = 16$ & $m = 11$		A1	Both values correct
					Total 2 marks

8	(a)		$3 < w \leq 4$	1	B1
	(b)	$(12 \times 2.5) + (16 \times 3.5) + (9 \times 4.5) + (2 \times 5.5) + (1 \times 6.5)$ **or** $30 + 56 + 40.5 + 11 + 6.5\ (= 144)$		4	M2 for at least **4** correct products added (need not be evaluated) **or** If not M2 then award M1 for consistent use of value within interval (including end points) for at least **4** products which must be added **or** correct midpoints used for at least **4** products and not added
		$[(12 \times 2.5) + (16 \times 3.5) + (9 \times 4.5) + (2 \times 5.5) + (1 \times 6.5)] \div 40$ **or** '144' ÷ 40			M1 dep on at least M1 Allow division by their Σf provided addition or total under column seen
			3.6		A1 oe
	(c)	$\frac{2}{40} + \frac{1}{40}$		2	M1 for $\frac{a}{40}$ where $0 < a < 40$ or $\frac{3}{b}$ where $b > 3$ where a and b are integers
			$\frac{3}{40}$		A1 0.075 oe
					Total 7 marks

9	(a)	$7 - 3$		2	M1	or $3 - 7$
			4		A1	
	(b)		6	1	B1	
	(c)	$3\times4+4\times8+5\times10+6\times12+7\times4\ (=194)$ $(12 + 32 + 50 + 72 + 28)$		3	M1	for at least 4 correct products and intention to add. Products may be seen by the side of the table
		"194"÷(4+8+10+12+4)(= 5.105....) "194" ÷ "38"			M1	dep on M1
		Working not required, so correct answer scores full marks (unless from obvious incorrect working)	5.1		A1	accept 5.1–5.106
						Total 6 marks

10	a		3	1	B1

11	$a = 7$		4	B1
	$\frac{b + \text{their } a}{2} = 8.5$ oe **or** $b = 10$			M1 ft their value of a **or** for setting up an equation for b **or** $b = 10$
	$\frac{\text{their } a + \text{their } a + \text{their } b + c}{4} = 9$ oe or $(c =)\ 9 \times 4 - (2 \times \text{their } a + \text{their } b)$ oe			M1 for a calculation involving c using their values **or** for a calculation leading to c using their values
		7, 10, 12		A1
				Total 4 marks

12	(a)	$4 - -6$ or $-6 - 4$ or -10		2	M1	Identifying 4 and – 6 only. or for stating 10 or – 10
			10		A1	
	(b)	$-6, -5, -1, 3, 4$ **or** $4, 3, -1, -5, -6$		2	M1	Putting temperatures in ascending or descending order.
			-1		A1	
	(c)	$\frac{3}{5} \times 100$ oe		2	M1	accept $\frac{3}{5}$ or 0.6 oe
			60		A1	
	(d)	$-6 + 8$		2	M1	
			2		A1	Accept +2
						Total 8 marks

13	$(11 \times 3) + (8 \times 5) + (6 \times 7) + (5 \times 9)$ (= 160) (= 33 + 40 + 42 + 45 = 160)		4	M1	Correct numerical products using midpoints (allowing one error) with intention to add. May be seen in table.
	"160" + x = 4. 25 × (11 + 8 + 6 + 5 + x) oe or $\frac{"160"+x}{"30"+x} = 4.25$ or "160" + x = 4.25 × "30" + 4.25x			M1	dep M1 for correct equation ft *their* 160.
	"160" − "127.5" = 4.25x − x or 32.5 = 3.25x			M1	Isolating x and number terms
		10		A1	dep 1st M1
					Total 4 marks
Alternative Mark Scheme for question 13					
13	$(11 \times 3) + (8 \times 5) + (6 \times 7) + (5 \times 9)$ (= 33 + 40 + 42 + 45 = 160)		4	M1	Correct numerical products using midpoints (allowing one error) with intention to add. May be seen in table.
	4.25y = "160" + [y − (11 + 8 + 6 + 5)] oe 4.25y = 160 + y − 30			M1	dep M1 for correct equation ft *their* 160, where y = total number of pupils
	4.25y − y = 160 − 30 or 3.25y = 130 or y = 40			M1	Isolating y and number terms **or** y = 40
		10		A1	dep 1st M1
					Total 4 marks

14	(a)		$70 < s \leq 80$	1	B1	
	(b)	$10 \times 45 + 16 \times 55 + 19 \times 65 + 23 \times 75 + 12 \times 85$ **or** 450 + 880 + 1235 + 1725 + 1020 (= 5310)		4	M2	$f \times d$ for at least 4 products with correct mid-interval values and intention to add. If not M2 then award M1 for d used consistently for at least 4 products within interval (including end points) and intention to add **or** for at least 4 correct products with correct mid-interval values with no intention to add
		"5310" ÷ 80			M1	dep on at least M1 allow division by their $\sum f$ provided addition or total under column seen
			66.4		A1	accept 66.37 – 66.4
						Total 5 marks

15		3, 7, 8, 8 and one of 4 or 5 or 6		B3	For a list of 5 correct numbers (B2 for a list of 5 numbers with 2 of: median of 7, mode of 8, range of 5 B1 for a list of 5 or 6 numbers with 1 of: median of 7, mode of 8, range of 5)
					Total 3 marks

16		5 × 398 (= 1990) or 6 × 401 (= 2406)		3	M1	Correct total for 5 or for 6 cocoa pods
		"2406" – "1990"			M1	(M2 for 398 + 6 × 3 or 401 + 5 × 3)
			416		A1	
						Total 3 marks

17	$5 \times 12\ (=60)$ **or** $\frac{15+7-2+23+x}{5}=12$ oe **or** $\frac{x+"43"}{5}=12$		3	M1	for a method to find the total of the 5 numbers **or** setting up an equation in x "43" comes from $15 + 7 - 2 + 23$
	$x + 15 + 7 - 2 + 23 =$ "60" **or** $x +$ "43" = "60" **or** "60" $-$ $(15 + 7 - 2 + 23)$			M1	for forming an equation with their 60 **or** for a complete calculation to find the value of x "43" comes from $15 + 7 - 2 + 23$
		17		A1	
					Total 3 marks

18	(a)		2	1	B1	Do not allow 12
	(b)	e.g. $0 \times 1 + 1 \times 5 + 2 \times 12 + 3 \times 9 + 4 \times 11 + 5 \times 2\ (=110)$ **or** $0 + 5 + 24 + 27 + 44 + 10\ (=110)$		3	M1	for at least 4 correct products with intention to add
		e.g. "110" ÷ 40			M1	
			2.75		A1	oe If no other marks awarded, award SC B1 for an answer of 2.775
						Total 4 marks

19	eg $\frac{158+C}{2}=160$ **or** $(C=)\ 160 + (160 - 158)\ (=162)$ oe **or** $(C=)\ 162$		3	M1	for method to find Candela's height or Candela's height or Candela's height in the wrong place on the answer line
	eg $(D=)\ 175 - 21$ **(=** 154) oe			M1	indep for method to find Diana's height or Diana's height or Diana's height in the wrong place on the answer line
		Candela 162 Diana 154		A1	Correctly attributed If no marks awarded, SCB1 for Candela's height 179
					Total 3 marks

20	(a)	$(0 \times 6) + (1 \times 5) + (2 \times 4) + (3 \times 7) + (4 \times 3)\ (=46)$ or $0 + 5 + 8 + 21 + 12\ (=46)$		3	M1 for at least 4 products added or intention to add (need not be evaluated)
		'46' ÷ 25			M1 dep on M1
			1.84		A1 SC B1 for answer only of 2.08 oe

21				3	M1	for $d = 9$ **or** $(c + d) \div 2 = 8$ (algebraically or clearly labelled integers) **or** $d - a = 4$ (algebraically or clearly labelled integers)
					M1	for two of $a = 5$ **or** $c = 7$ **or** $d = 9$ **or** $(c + d) \div 2 = 8$ (algebraically or clearly labelled integers) **or** $d - a = 4$ (algebraically or clearly labelled integers)
			$a = 5, b = 6,$ $c = 7, d = 9$		A1	All correct
						Total 3 marks

22	$0 \times 5 + 1 \times 5 + 2 \times 3 + 3 \times 10 + 4 \times 7 + 5 \times 6\ (=99)$ **or** $0 + 5 + 6 + 30 + 28 + 30\ (=99)$		3	M1	for at least 4 correct products with intention to add
	"99" ÷ 36			M1	
		2.75		A1	oe If no other marks awarded, award SC B1 for 2.8(88…)
					Total 3 marks

23				4	B1 for 80
	for $\frac{a+75}{2} = 74$ oe **or** 73				M1 for setting up an equation using the median **or** for 73
	for 80 – 16 (= 64) oe				M1 for using the range correctly **or** for 64
			64, 73, 80		A1 answers can be in any order
					Total 4 marks

24	(a)		34	1	B1
	(b)		18	1	B1
					Total 2 marks

25	22 × 260 (= 5720) or 50 × 218 (= 10 900)		3	M1
	$\frac{'10900' - '5720'}{28}$ $\left(=\frac{5180}{28}\right)$			M1
		185		A1
				Total 3 marks

26	(a)		(5), 8, 8, 20, *x*, (24)	3	B3	for (5), 8, 8, 20, *x*, (24) where *x* = 21 **or** 22 **or** 23
					(B2	for (5), 8, 8, 20, *x*, (24) where *x* is blank or **any** value other than 21, 22 or 23)
					(B1	for a list with a median of 14 **or** a mode of 8 **or** the 3rd and 4th cards having a sum of 28 (ignoring other cards))
	(b)	eg 5 × 21 (= 105) **or** 6 × 23 (= 138)		3	M1	
		eg 6 × 23 – 5 × 21			M1	
			33		A1	
						Total 6 marks

27	$0\times13+1\times17+2\times8+3x+4\times11$ or (0 +) 17 + 16 + 3*x* + 44 (= 77 + 3*x*)		4	M1	at least **3** correct products with intention to add. eg award for 77 seen as this is sum of 3 products
	$(13+17+8+x+11)$ oe eg $49+x$ **or** $98+2x$			M1	Sum for total frequency or (frequency × 2)
	$\frac{"77+3x"}{"49+x"} = 2$ oe e.g. $"77+3x" = 2("49+x")$			M1	for use of mean in valid equation (ft their values for sum of products and their total frequency if M2 awarded previously)
		21		A1	
					Total 4 marks

28	(a)		$48 < S \leqslant 54$	1	B1	Allow 48 – 54 oe
	(b)	(33 × 4) + (39 × 14) + (45 × 18) + (51 × 19) + (57 × 5) or 132 + 546 + 810 + 969 + 285 (= 2742) [lower bound products are: 120, 504, 756, 912, 270] [upper bound products are: 144, 588, 864, 1026, 300]		4	M2	M2 for at least **4** correct products added (need not be evaluated) **or** If not M2 then award: M1 for consistent use of value within interval (including end points) for at least **4** products which must be added or correct midpoints used for at least **4** products and not added
		$\frac{"2742"}{60}$			M1	dep on M1 Allow division by their Σf provided addition or total under column seen
		Correct answer scores full marks (unless from obvious incorrect working)	45.7		A1oe	$45\frac{7}{10}$ or $\frac{457}{10}$ (accept 46 from correct working)
						Total 5 marks

29		(x =) 3	3	B1	
		(y =) 6		B1	
		(z =) 10		B1	
				Total 3 marks	

30	55 × 32 (= 1760) **or** 52 × 28 (= 1456) **or** 55 × 32 + 52 × 28 (= 3216)		3	M1	for one correct product or method to find the total mark for both classes
	eg $\frac{"1760"+"1456"}{32+28}$ **or** $\frac{3216}{60}$			M1	for a complete method
	Correct answer scores full marks (unless from obvious incorrect working)	53.6		A1	
				Total 3 marks	

31	6 × 11 + 18 × 25 + 30 × 23 + 42 × 15 + 54 × 6 (= 2160) **or** 66 + 450 + 690 + 630 + 324 (= 2160) [lower bound products are: 0, 300, 552, 540, 288] [upper bound products are: 132, 600, 828, 720, 360]		4	M2 for at least **4** correct products added (need not be evaluated) **or** If not M2 then award: M1 for consistent use of value within interval (including end points) for at least **4** products which must be added or correct midpoints used for at least **4** products and not added
	"2160" ÷ "80"			M1 dep on at least M1 Allow division by their Σf provided addition or total under column seen
	Correct answer scores full marks (unless from obvious incorrect working)	27		A1
				Total 4 marks

32	(a)		11	1	B1	
	(b)	21 ÷ 2 (=10.5) or 11th oe or 10,11,11,11,,,,12,12,13… etc with no more than one error		2	M1	For a correct method to find position of median
			13		A1	
	(c)	10×1+11×7+12×2+13×5+14×4+15×2 or 10 + 77 + 24 + 65 + 56 + 30 oe		2	M1	For at least 4 correct products
		Correct answer scores full marks (unless from obvious incorrect working)	262		A1	(NB: an answer of 12.476.. alone or with 262 ÷ 21 gains M1 only)
						Total 5 marks

33	(a)		5	1	B1	
	(b)		3	1	B1	
	(c)	eg 0 × 3 + 1 × 7 + 2 × 6 + 3 × 11 + 4 × 1 + 5 × 2 (= 66) **or** 0 + 7 + 12 + 33 + 4 + 10 (= 66)		3	M1	for at least 5 correct products and intention to add
		"66" ÷ 30			M1	
		Correct answer scores full marks (unless from obvious incorrect working)	2.2		A1	oe
						Total 5 marks

34	104 × 5 (= 520) or 127 × 7 (= 889) or $\frac{m+tu+w+th+f}{5} = 104$ oe		3	M1
	"889" – "520" – 132 or "369" – 132 or $\frac{520+132+x}{7} = 127$ oe or $\frac{132+x}{2} = \frac{369}{2}$ oe $652 + x = 127 \times 7$			M1 (x = Sunday)
	Correct answer scores full marks (unless from obvious incorrect working)	237		A1
				Total 3 marks

35	(a)		13	1	B1	cao
	(b)		2.5	1	B1	oe
	(c)	8×5 (= 40) oe		3	M1	for a method to find the total number of goals scored
		$8 \times 5 - (1 + 1 + 2 + 2 + 3 + 6 + 14)$			M1	for a complete method to work out the value of x
		Correct answer scores full marks (unless from obvious incorrect working)	11		A1	
						Total 5 marks

36	17×11 (= 187) **or** 18.5×12 (=222) **or** 18×9 (=162) **or** 18.5×10 (= 185)		4	M1	Expression for total of **A** or **B** either including or excluding last round	M2 for $1.5 \times 11 + 18.5$ (= 35) **or** $9 \times 0.5 + 18.5$ (= 23) OR 1.5×11 (= 16.5) **or** 0.5×9 (= 4.5)
	$18.5 \times 12 - 17 \times 11$ ("222" – "187")(= 35) **or** $18.5 \times 10 - 18 \times 9$ ("185" – "162")(= 23) **or** $\frac{"187"+x}{12} = 18.5$ $(x = 35)$ **or** $\frac{"162"+y}{10} = 18.5$ $(y = 23)$ **or** Diff between **A** and **B** in first rounds "187" – "162" (= 25) **or** Diff between **A** and **B** after further round "222" – "185" (= 37) [or 2×18.5 (= 37) where 2 must come from correct working]			M1	expression for number of points gained by **A** or **B** in the last round or for an equation that could lead to the number of points gained by **A** or **B** in the last round	
	"35" – "23" or "37" – "25" or "16.5" – "4.5"			M1	calculation for difference between number of points scored in last round	
	Correct answer scores full marks (unless from obvious incorrect working)	12		A1		
						Total 4 marks
The 2 is 2 further rounds of 18.5 ie 37 comes from $18.5 \times 12 - 18.5 \times 10$ so the 2×18.5 is $(12 - 10) \times 18.5$						