sequences

1	11 (a)	Reasonable diagram, 25, 13, 62	4	**B1 B1 B1 B1** diagram may be freehand
	(b)	64, 19, 146	3	**B1 B1 B1**
	(c)	n^2 oe		**B1**
		$2n + 3$ oe	2	**B1**
	(d)(i)	2	1	
	(ii)	20202 **ft**	1**ft**	**ft** 10101 × their k

2	10 (a)	Pentagon	1	
		Octagon 20	1, 1	
	(b)(i)	35	1	
	(ii)	54	1	
	(c)(i)	$p = 2, q = 3$	3	**M1** for substituting a value of n e.g. $\dfrac{1}{p}4(4-q) = 2$ $n \geq 3$ **or M1** for number of diagonals from one vertex is $n - 3$ (allow in words) **and B1** for one correct value. If 0, SC1 for $\dfrac{n}{2}(n-3)$ seen.
	(ii)	4850 ft	1**ft**	**ft** their **(c)(i)** allow only if **ft** calculates to a positive integer.
	(iii)	20 cao	2	**SC1** for answer of 17 or **M1** for their formula = 170
	(d)	31 cao	1	

3	10 (a)	Dots all correctly placed in Diagram 4	1	
	(b)	Column 4 16, 25, 16, 41	7	**B2 or B1** for three correct
		Column 5 25, 41, 20, 61		**B2 or B1** for three correct
		Column n: n^2, $4n$, $n^2 + (n+1)^2$ oe		**B1 B1 B1** oe likely to be $(n-1)^2 + n^2 + 4n$ or $2n^2 + 2n + 1$
				After any correct answer for column n, apply isw
	(c)(i)	79 601 cao	1	
	(ii)	800 ft	1**ft**	**ft** their $4n$ linear expression only
	(d)	12 cao	1	

4	9	(a)	(i) 21	1	
			(ii) $P_6 = \frac{1}{2} \times 6 \times 7$ or better (= 21)	1	Allow 3(6 + 1)
			(iii) 1275	1	
			(iv) 3825	1ft	ft for 3 × their **(iii)**
			(v) 11325	1	
			(vi) 7500	1ft	ft their **(v)** – their **(iv)** provided > 0
		(b)	(i) 56	2	**M1** for $1 \times 6 + 2 \times 5 + 3 \times 4 + 4 \times 3 + 5 \times 2 + 6 \times 1$
			(ii) $S_6 = \frac{1}{6} \times 6 \times 7 \times 8$ or better (= 56)	1	
			(iii) 1540	1	
		(c)	56 – 35 = 21	1	
		(d)	Correct algebraic proof with no errors	3	**M1** for $\frac{1}{6}n(n+1)(n+2) - \frac{1}{6}(n-1)(n)(n+1)$ oe and **M1** for $\frac{1}{6}n(n+1)(3)$ oe
5	10	(a)	21 and 34	1	
		(b)	–5 8	1 + 1	
		(c)	(i) 4, 6	3	**M1** for $2 + d = e$ oe or $d + e = 10$ oe seen and either **M1** for a correct eqn in d or e seen e.g. $2e = 12$ oe or $2d = 8$ oe or **B1** for either correct
			(ii) $x = 28$ $y = -5$ $z = 23$	5	**B4** for any two correct or **M3** for **any** of $18 = 3x - 66$ oe or $3y + 33 = 18$ oe or $33 - 3z = -36$ oe or **M1** for **2** of $y = x - 33$ oe or $y + z = 18$ oe or $x + y = z$ oe and **M1** for combining two of the previous equations correctly isw (does not have to be simplified) after 0 scored **SC1** for $-33 +$ their $x =$ their y or their $x +$ their $y =$ their z or their $y +$ their $z = 18$

6	11	(a)	30 42 42 56 71 97	4	**B3** for 2 correct rows or **B2** for 1 correct row or **B1** for any term in column 5 correct
		(b)	(i) 2550 (ii) 30	1 1	
		(c)	$(n + 1)(n + 2)$ oe final ans	1	
		(d)	(i) $2n^2 + pn + 1 = t$ Uses a value of n up to 6 and a matching t from the table e.g. puts $n = 3$ and $t = 31$ $2 \times 3^2 + 3p + 1 = 31$ **M1** **OR** Use $p = 4$ to get $2n^2 + 4n + 1 = 31$ and simplifies to 3 term eqn **M1** **OR** both $2 \times 9 + 4 \times 3 + 1 (= 31)$ **M1** with one part evaluated **OR** $n(n + 1) + (n + 1)(n + 2) - 1$ or better **M1**	2	Correct solution shown with 1 intermediate step to $p = 4$ **E1** Solve correctly to get $n = 3$ **E1** Conclusion e.g. 31 = 31 **E1** Correct simplification to $2n^2 + 4n + 1$ **E1**
			(ii) 241 (iii) 12	1 3	**M1** for $2n^2 + 4n + 1 = 337$ and **M1** for $(n - 12)(n + 14)$ or correct expression for n using formula
		(e)	$L = A + D - 1$ oe	1	
7	10	(a)	$(A$ 1) 8 27 64 125 $(B$ 4) 8 12 16 20 $(C$ 4) 9 16 25 36	2 1 2	B1 for 3 correct B1 for 3 correct
		(b)	512 169	1 1	
		(c)	25 99	1 1	
		(d)	145 $n^3 + 4n$ oe 16 $(n + 1)^2 - 4n$ oe but isw	1, 1 1, 1	Likely oe is $(n - 1)^2$

8	9 (a)	(i)	3, 8, 15 in correct positions	2	B1 for 2 correct values in correct positions
		(ii)	12	3	M2 for $12 \times (12 + 2)$ $(= 168)$ or $12, (12 + 2)$
					or M1 for $n^2 + 2n = 168$ then
					M1 for $(n + a)(n + b)$ where a and b are integers and $ab = -168$ or $a + b = 2$ oe
	(b)	(i)	$2 + 3n$ oe	2	Allow unsimplified e.g. $5 + 3(n - 1)$
					B1 for $3n$ oe seen
		(ii)	2^{n-1} oe	2	B1 for 2^k seen
	(c)		$a = \dfrac{1}{2}$, $b = 1\dfrac{1}{2}$ cao	6	B1 for 12 or 30 seen but if 30 clearly only from Diagram 4 then B0.
					M1 for any 1 of $a + b + 1 = 3$ oe
					$\qquad\qquad 8a + 4b + 2 = 12$ oe
					$\qquad\qquad 27a + 9b + 3 = 30$ oe
					M1 for a 2nd of the above equations
					M1 (indep) for correctly eliminating a or b from pair of linear equations
					B1 for one correct value
9	11 (a)	(i)	10	1	
		(ii)	$\dfrac{3 \times 4}{2}$ or $\dfrac{3 \times (3 + 1)}{2}$ $(= 6)$	1	
		(iii)	7260	1	
		(iv)	12 840	2	M1 for $S_{200} - S_{120}$ $(20100 - 7260)$ or $\frac{80}{2}(121 + 200)$ o.e.
		(v)	160 400	2	M1 for $2(1 + 2 + 3 + \ldots\ldots + 400)$ o.e.
	(b)	(i)	36, 100	1, 1	Ignore right-hand column
		(ii)	11025	1	
		(iii)	$\left[\dfrac{n(n+1)}{2}\right]^2$ oe	1	isw
		(iv)	3 348 900	1	M1 for square root then $\times 2$ (1056)
		(v)	32	2	or SC1 for answer 33
10	12	(a) (i)	12, …, 30	**2**	**B1** each
		(ii)	$(n + 1)(n + 2)$ oe	1	isw if expand incorrectly
		(iii)	$p = 2$	1	
			$q = 2$	1	
		(iv)	69(th), 70(th)	**2**	**M1** for their $2n + 2 = 140$ soi
		(b) (i)	$2 \times 3 + 7$	**1**	Accept $2 \times 3 + 2 \times 2 + 3$
		(ii)	27	**1**	
		(iii)	1707, …, 13 653	**1,1**	

11	6	(a)	$(x =)\ 64$ www 3	3	**B2** for $x + 2x + x = 360 - 114 + 10$ or better or **M1** for $x + 2x + 114 + x - 10 = 360$
		(b) (i)	-1 n^2 oe $5n$ oe $n^2 + 5n$ oe	1 1 1 1	
		(ii)	20	2	**M1** for their $n^2 + 5n = 500$ or 20 **and** 25 seen
		(c)	**Final answer** $\dfrac{x-4}{2x-1}$ cao www 4	4	**B1** for $(x-4)(x+4)$ **B2** for $(2x-1)(x+4)$ or **SC1** for $(2x + a)(x + b)$ where either $a + 2b = 7$ or $ab = -4$
12	11	**(a)**	33, 41 $16\pi, 25\pi$ $20\pi, 30\pi$	1 1 2	**B1** each
		(b) (i)	$8n + 1$ oe final answer	2	e.g. $9 + 8(n-1)$, condone $n = 8n + 1$ **SC1** for $8n + k$
		(ii)	137 www2	2	**M1** for their (b)(i) = 1097
		(c) (i)	$n^2\pi$ oe final answer	1	
		(ii)	$9n^2\pi$ oe final answer	1	Allow $(3n)^2\pi$
		(d)	$n(n+1)\pi$ oe final answer	2	**SC1** for a quadratic expression e.g. $n(n+1)$, $n^2 + 5$, $n^2 + n\,\pi$
13	10	**(a)** A 1, $13 - 2n$ oe		3	**B1, B2 (M1** for $k - 2n$) oe
		B 36, n^2 oe		2	**B1, B1**
		C 42, $n(n+1)$ oe		3	**B1, B2 (B1** for a quadratic in n)
		D 729, 3^n oe		2	**B1, B1**
		E 687, $3^n - n(n+1)$ oe		2ft	**B1ft** *their D – their C* , **B1ft** *their D – their C* only if both in terms of n
		(b) (i) $\quad -187$		1ft	ft if A is linear
		(ii) 10 100		1ft	ft if C is quadratic
		(c) 8		1	
		(d) 58 939		1	

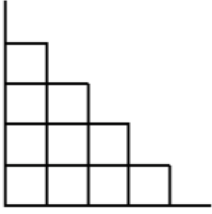|					
14	10	(a)	50, 70	1	
			10n oe	1	
			51, 71	1	
			10n + 1 oe	1	
	(b)	(i)	212	1	
		(ii)	20n + 12	1	
		(iii)	20n + 152	1	
	(c)	(i)	$5 \times 3^2 + 6 \times 3 = 63$ and 11 + 21 + 31 = 63 or 32 + 31 = 63 or 11 + 52 = 63	1 1	
		(ii)	560	1	
	(d)		Complete solution with no errors seen and a conclusion e.g. $5n^2 + 6n + 10(n + 1) + 1$ $= 5n^2 + 6n + 10n + 10 + 1$ $= 5n^2 + 10n + 5 + 6n + 6$ $= 5n^2 + 10n + 5 + 6n + 6$ $= 5(n + 1)^2 + 6(n + 1)$	4	**B1** for $5n^2 + 6n + 10n + 10 + 1$ or better **B1** for use of $5(n + 1)^2 = 5n^2 + 10n + 5$ oe at any stage **B1** for use of $6n + 6 = 6(n + 1)$ oe at any stage
15	10	(a)	(i) 4.5 or 4½	3	**M2** for a complete correct method **or M1** for one correct step at any stage.
			(ii) $(x - 6)(x - 1)$	M2	**M1** for $(x + a)(x + b)$ where $ab = 6$ **or** $a + b = -7$
			1, 6	A1FT	**FT** their brackets **dep** on **M1** earned After **M0** scored **SC1** for 1, 6 as answer
			(iii) 6	4	**B1** for $2(3x - 2) + x + 2 = 4 \times 10$ oe **and B1** for correct multiplication of a bracket **and M1** for correct rearrangement of their linear equation without brackets to $ax = b + c + d$ or better

	(b)		$a = 1/3$ oe, $b = 1/2$ oe	6	**B1** for any one of
					    $1 = a + b + 1/6$ oe
					    $5 = 8a + 4b + 2/6$ oe
					    $14 = 27a + 9b + 3/6$ oe
					    $30 = 64a + 16b + 4/6$ oe
					Or any other correct equation
					and B1 for another of the above equations
					and M1 for equating one coefficient
					or correct rearrangement to give a or b as subject
					and M1 for subtracting to eliminate a or b
					or correct substitution for *their a* or their b
					A1 for $a = 1/3$ oe or $b = 1/2$ oe

16	10	(a)	(i)	$1 + 2 + 3 + 4 + 5 = 15$	1	
			(ii)	Correct substitution equating to sum e.g. $\dfrac{2(2+1)}{k} = 3$ **and** $k = 2$ stated with no errors seen	2	**M1** for using a value of n in $\dfrac{n(n+1)}{k}$ e.g. $\dfrac{2(2+1)}{k} = 3$ or for a verification using $k = 2$ e.g. $\dfrac{2(2+1)}{2} = 3$
			(iii)	1830	1	
			(iv)	30	2	**M1** for $\dfrac{n(n+1)}{2} = 465$ or better
			(v)	$n - 8$	1	
		(b)	(i)	225, 15	2	**B1** either
			(ii)	$\dfrac{n^2(n+1)^2}{4}$ oe	1	
			(iii)	36100	2	**M1** for $\dfrac{19^2(19+1)^2}{4}$ oe or 190^2

17							
	10	(a)	48 and 57, $\quad$ $9n + 3$ oe	1	2		**B1** for $9n + k$ oe
		(b)	56 and 50, $\quad$ $86 - 6n$ oe	1	2		**B1** for $k - 6n$ oe
		(c)	125 and 216, $\quad$ n^3 oe	1	1		
		(d)	130 and 222 $\quad$ $n^3 + n$ oe	1	1FT		FT *their* (c) $+ n$ dep on expression in n in (c)

18					
	9	(a)	15 $\quad$ 18 $\quad$ $3n + 3$ or $3(n+1)$ $\quad$ 6 $\quad$ 10 $\quad$ 25 $\quad$ 36 $\quad$ $(n+1)^2$	9	**B2** for 15, 6, 25 or **B1** for two correct values **B3** for 18, 10, 36 or **B1** for each correct value **B2** for $3n + 3$ oe or **M1** for $3n + k$, for any k **B2** for $(n + 1)^2$ oe or **M1** for a quadratic expression
		(b)	14	2	**M1** for $(n + 1)(n + 2) = 240$ or better or $15 \times 16 = 240$
		(c) (i)	½ $+ p + q = 9$	1	
		(ii)	$[p =]$ 3 $[q =]$ $\dfrac{11}{2}$	5	**B2** for $4p + 2q = 23$ or **B1** for $½ \times 2_3 + p \times 2_2 + q \times 2$ oe **M1** for correct multiplication and subtraction of *their* equations **A1** for $[p =]$ 3 or $[q =]$ $\dfrac{11}{2}$ If 0 scored then **SC1** for either correct

19	11	(a)	$\dfrac{1}{8}$ $\dfrac{1}{16}$ $\dfrac{1}{32}$	2	**B1** for 2 correct
			$\dfrac{1}{2^{n-1}}$ oe	2	**SC1** for $\dfrac{1}{2^n}$ oe
			2^{-3} 2^{-4} 2^{-5}	1	
			2^{1-n} or $2^{-(n-1)}$	1	
		(b) (i)	64 256 1024	1	
			2^6 2^8 2^{10}	1	
		(ii)	$2^{2(n-1)}$ or 2^{2n-2}	1	
		(c)	16384	2	**B1** for $n = 8$
20	9	(a)	36, 9, 45	2	**B1** for two correct values
			$8n + 4$ oe	2	**M1** for $8n + k$, for any k
			$(n - 1)^2$ oe	2	**M1** for a quadratic expression of form $n2$ $[+ an + b]$ oe
		(b)	19	2	**M1** for $(n + 1)(n + 5) = 480$ or better or 20×24 seen
		(c) (i)	$\dfrac{1}{3} + p + q = 12$ and no errors seen	1	Accept $p + q = 12 - \dfrac{1}{3}$ after $\dfrac{1}{3}[1^3] + p[1^2] + q[1]$ shown
		(ii)	$\dfrac{1}{3} \times 8 + 4p + 2q = 12 + 21$	2	**M1** for $12 + 21$ seen or 33 seen
		(iii)	$[p =]\ \dfrac{7}{2}$ oe $[q =]\ \dfrac{49}{6}$ oe	3	**M1** for correct multiplication and subtraction or substitution using the correct given equations **B1** for $[p =]\ \dfrac{7}{2}$ or $[q =]\ \dfrac{49}{6}$ After 0 scored, **SC1** for 2 values satisfying one of the original correct given equations
21	9	(a)	28 45 17 21 45 66	1, 1 1 1	
		(b) (i)	$4n - 3$ oe	2	**M1** for $4n + k$
		(ii)	237	1	
		(iii)	50	2FT	**FT** *their* (b)(i) = 200 solved and then answer truncated **dep** on linear expression of form $an + k$ **M1** for *their* $4n - 3 = 200$ or *their* $4n - 3 \leqslant 200$

		(c)	$p = 2$ and $q = -5$ with some correct supporting working leading to the solutions	**5**	**M2** for any 2 of $p + q + 3 = 0$ oe, $2^2 p + 2q + 3 = 1$ oe, $3^2 p + 3q + 3 = 6$ oe, $4^2 p + 4q + 3 = 15$ oe , $5^2 p + 5q + 3 = $ *their* 28 oe, etc. or **M1** for any one of these **M1** indep for correctly eliminating p or q from pair of linear equations **A1** for one correct value If 0 scored **SC1** for 2 values that satisfy one of their original equations After **M0**, 2 correct answers **SC1**
		(d)	$2n^2 - n$ or $n(2n - 1)$	**2**	**B1** for answer $2n^2 + k[n]$ or **M1** for *their quadratic* from **(c)** + *their linear* from **(b)(i)**
22	**11**	**(a)**	$\dfrac{5}{7}$ $\dfrac{n}{n+2}$ oe 7 $n + 2$ oe 3 $n - 2$ oe 21 $n^2 - 4$ oe	**8**	**B1** each
		(b)	72	**2**	**M1** for $\dfrac{72}{74}$ or *their* $\dfrac{n}{n+2} = \dfrac{36}{37}$
		(c)	27	**2**	**M1** for *their* $(n^2 - 4) = 725$ or 25×29 [$= 725$]

23	9	(a)	(i) 16	1	
			(ii) n^2	1	
		(b)	(i) 43	1	
			(ii) 7	1	
		(c)	$a = \dfrac{5}{2}$ oe, $b = \dfrac{5}{6}$ oe with supporting working	6	**M1** for any correct substitution eg $\dfrac{2}{3}(2)^3 + 2^2 a + 2b$ **A1** for **one** of eg $\dfrac{2}{3} + a + b = 4$ or better eg $\dfrac{16}{3} + 4a + 2b = 17$ or better eg $\dfrac{54}{3} + 9a + 3b = 43$ or better **A1** for **another** of eg $\dfrac{2}{3} + a + b = 4$ or better eg $\dfrac{16}{3} + 4a + 2b = 17$ or better eg $\dfrac{54}{3} + 9a + 3b = 43$ or better **M1** for correctly eliminating one variable from two of *their* equations in a and b **A1** for $a = \dfrac{5}{2}$ oe **A1** for $b = \dfrac{5}{6}$ oe After zero scored, **SC2** for 2 correct answers without supporting working or **SC1** for 2 of 17, 43, 86, 150, 239 seen
24	10		**A** $-13, -20$	1	
			$-7n + 22$ oe	2	**SC1** for $-7n + k$ or $kn + 22$ oe
			B $\dfrac{9}{22}, \dfrac{10}{23}$	1	
			$\dfrac{n+4}{n+17}$ oe	2	**B1** for $n + 4$ oe or $n + 17$ oe seen, but not in wrong position
			C $26, 37$	1	
			$n^2 + 1$ oe	1	
			D $162, 486$	1	
			$2 \times 3^{n-1}$ oe	2	**SC1** for $k \times 3^{n+p}$ [k, p integers] Accept $2 \times \dfrac{3^n}{3}$

25	11	(a)		1	
		(b)	30	1	
			10	1	
		(c)	$n(n+1)$ oe	2	**B1** for $an^2 + bn + c$ a, b, c numeric $a \neq 0$
		(d)	$\frac{1}{2}n(n-1)$ oe	2	**B1** for using $\frac{1}{2}$ oe in expression of form $\frac{1}{2}(an^2 + bn + c)$ $a \neq 0$ or $kn(n-1)$ $k \neq 0$
26	10	(a)	10 15 15 21 35 48	6	**B1** for each correct entry
		(b) (i)	3	2	**M1** for any correct substitution in $n^2 + 4n + p$ = number of tiles eg $2^2 + 4(2) + p = 15$
		(ii)	143	1FT	**FT** $140 + their$ (b)(i)
		(c)	$a = \frac{1}{2}$ oe $b = \frac{3}{2}$ oe nfww	5	**B1** for a correct simplified equation e.g. $a + b + 1 = 3$, $4a + 2b + 1 = 6$, $9a + 3b + 1 = 10$ etc **B1** for a 2nd correct simplified equation **M1** for correctly eliminating one variable for *their* equations in *a* and *b* **A1** for $a = \frac{1}{2}$ nfww **A1** for $b = \frac{3}{2}$ nfww
27	9(a)(i)		5 and 13	1	
	9(a)(ii)		$8n - 3 = 203$	M1	Evaluation of 25th or 26th term with supporting evidence or explanation
			25.75 or $25\frac{3}{4}$	A1	Second evaluation of 25th or 26th terms with supporting evidence or explanation If zero scored, **SC1** for 25.75 or 197 and 205 with partial evidence or explanation
	9(b)(i)		$6n + 7$ oe final answer	2	**B1** for $6n + c$ or $kn + 7$ $k \neq 0$
	9(b)(ii)		$n^2 + n + 2$ oe final answer	2	**B1** for a quadratic expression or second difference = 2
	9(c)		$[y =]$ 10	2	**M1** for $5(20 - y) = 50$
			[First term =] 14	2	**M1** for $5(x - their\ y) = 20$ or for $20 \div 5 + their\ y$

28	6(a)	18 22 $4n + 2$ oe 17 26 $n^2 + 1$ oe	6	**B2** for 18, 22, 17, 26 or **B1** for two or three correct values AND **B2** for $4n + 2$ oe or **B1** for $4n + k$ oe or $pn + 2$ $(p \neq 0)$ AND **B2** for $n^2 + 1$ oe or **B1** for $n^2 + k$ oe
	6(b)	242	1	**FT** *their* $4n + 2$ provided a linear expression
	6(c)	15	1	
	6(d)	3	2	**M1** for $2 \times 1^2 + 2 \times 1 + q = 7$ oe
29	12(a)	18 28	2	**B1** for each
	12(b)	$3n + 3$ oe	2	**B1** for $3n + k$ oe or $cn + 3$ oe $c \neq 0$
	12(c)	45	2	**M1** for identifying 7th pattern or **M1** for *their* $(3n + 3) = 24$
	12(d)	$[a =]\dfrac{3}{2}$ oe $[b =]\dfrac{13}{3}$ oe	6	**M1** for any correct substitution e.g. $\dfrac{1}{6}(2)^3 + 2^2a + 2b$ **A1** for one of e.g. $\dfrac{1}{6} + a + b = 6$ oe $\dfrac{8}{6} + 4a + 2b = 16$ oe $\dfrac{27}{6} + 9a + 3b = 31$ oe $\dfrac{64}{6} + 16a + 4b = 52$ oe **A1** for another of the above **M1** for correctly eliminating one variable from *their* equations **A1** for $a = \dfrac{3}{2}$ **A1** for $b = \dfrac{13}{3}$ oe

30	11(a)	40 54	4	**B1** for each
		26 34		
	11(b)	$n^2 + 3n$ or $n(n+3)$ oe	2	**B1** for a quadratic expression or for 2nd common difference 2 (at least 2 shown) or for 2 correct equations seen or for subtracting n^2
	11(c)	100	2	**M1** for *their* **(b)** = 10300 seen
	11(d)	$[a =] \dfrac{1}{2}$ oe and $[b =] \dfrac{5}{2}$ oe	2	**B1** for each or **M1** for one correct equation or for 2nd difference = 1 soi (at least 2 shown)
31	7(a)	25 36 10 15 35 51	2	**B1** for 3, 4 or 5 correct
	7(b)	n^2	1	
	7(c)(i)	92	1	
	7(c)(ii)	$\dfrac{1}{2}(n^2 - n)$ oe	2	**M1** for $\dfrac{1}{2}(3n^2 - n) - n^2$ oe or for final quadratic answer with $\dfrac{1}{2}n^2$ oe or $-\dfrac{1}{2}n^2$ oe but not both
	7(d)	$a = \dfrac{1}{2}$, $b = \dfrac{1}{2}$	5	**B2** for 2 correct equations eg $a + b = 1$, $8a + 4b = 6$ or **B1** for 1 correct equation **B2** for one correct value or **M1** (dep on at least B1) for correctly eliminating one variable from two linear equations in a and b OR **B2** for $a = \dfrac{1}{2}$ or **B1** for 6a = 3 or for 3rd difference = 3 **B2** for $b = \dfrac{1}{2}$ or **M1** for substituting *their* a into a correct equation of first differences

32	11(a)	A : –3 $17 - 4n$ oe	**3**	**B1** for –3 **B2** for $17 - 4n$ oe or **B1** for $k - 4n$ oe or $17 - pn$ oe, $p \neq 0$
		B : 124 $n^3 - 1$ oe	**3**	**B1** for 124 **B2** for $n^3 - 1$ oe or **B1** for any cubic
		C : $\dfrac{11}{128}$ $\dfrac{n+6}{2^{n+2}}$ oe	**4**	**B1** for $\dfrac{11}{128}$ **B3** for $\dfrac{n+6}{2^{n+2}}$ oe or **B2** for 2^{n+2} oe seen or **B1** for 2^k oe or $n + 6$ seen
	11(b)	$\dfrac{p+1}{2q}$ oe	**2**	**B1** for $p + 1$ or $2q$ oe
33	11A	24	**B1**	
		$5n - 1$ oe	**B2**	**B1** for $5n - k$ or $jn - 1$ oe $j \neq 0$
	11B	127	**B1**	
		$n^3 + 2$ oe	**B2**	**B1** for n^3 oe
	11C	256	**B1**	
		$4^{(n-1)}$ oe	**B2**	**B1** for 4^k oe