Sequences – Answers

Sequences (Linear)

1) (a) 1, 4, 7, 10, 13, …, 298 (b) 9, 13, 17, 21, 25, …, 405 (c) 9, 5, 1, –3, –7, …, –387

2) (a) 3n – 1 (b) 4n – 3 (c) 2n – 1
(d) 28 – 5n (e) 4n – 2 (f) 35 – 4n
(g) 16 – 6n (h) 4n – 9 (i) 2 – 3n

Tables and Sequences

1)

x →	2x + 5
0 →	5
1 →	7
2 →	9
3 →	11
5 →	15
10 →	25
100→	205

x →	6x – 5
0 →	-5
1 →	1
2 →	7
3 →	13
5 →	25
10 →	55
100→	595

x →	4x + 7
0 →	7
1 →	11
2 →	15
3 →	19
5 →	27
10 →	47
100→	407

x →	3x – 2
0 →	–2
1 →	1
2 →	4
3 →	7
5 →	13
10 →	28
100→	298

x →	5x + 3
0 →	3
1 →	8
2 →	13
3 →	18
5 →	28
10 →	53
100→	503

2)

(a)

Term No:	1st	2nd	3rd	4th	5th	6th	7th	10th	100th	nth
Term:	2	5	8	11	14	17	20	29	299	3n – 1

(b)

Term No:	1st	2nd	3rd	4th	5th	6th	7th	10th	100th	nth
Term:	7	11	15	19	23	27	31	43	403	4n +3

(c)

Term No:	1st	2nd	3rd	4th	5th	6th	7th	10th	100th	nth
Term:	5	12	19	26	33	40	47	68	698	7n – 2

Sequences – complete

Sequences defined using a formula for the nth term

1) 1, 4, 7, 10, 13, …, 58 2) 3, 7, 13, 21, 31, …, 421 3) 1, 3, 9, 27, 81, …, 1162261467
4) 2, 8, 26, 80, 242, …, 3486784400 5) 8, 15, 24, 35, 48, …, 483

Finding the nth term

(a) $3n - 1$ (b) $4n - 3$ (c) 3^n (d) $\frac{n}{n+1}$
(e) $2 \times 4^{n-1}$ (f) $2n - 1$ (g) $28 - 5n$ (h) 2^n
(i) n^2 (j) $5 \times 2^{n-1}$ (k) 3^{n-1} (l) $n^2 + 3n$
(m) $\frac{n(n+1)}{2}$ (n) $4n - 2$ (o) $n^2 + 2n$ (p) 5^{n-1}
(q) $n^2 + 1$ (r) $n(n + 1)$ (s) $4 \times 3^{n-1}$ (t) 2^{4-n}

Sequences defined recursively

1) (a) 3, 7, 11, 15, 19, 23, 27 (b) 2, 6, 18, 54, 162, 486, 1458 (c) 2, 3, 5, 9, 17, 33, 65
(d) 1, 3, 5, 11, 21, 43, 85 (e) 4, 1, –3, –4, –1, 3, 4, (f) 1, 4, 9, 16, 25, 36, 49

2) (a) $u_1 = 3$; $u_n = 2u_{n-1}$ (b) $u_1 = 2$; $u_n = 2u_{n-1} + 1$ (c) $u_1 = 1$, $u_2 = 3$; $u_n = 2u_{n-1} + u_{n-2}$
(d) $u_1 = 2$, $u_2 = 3$; $u_n = u_{n-1} + u_{n-2} + 1$ (e) $u_1 = 1$, $u_2 = 2$, $u_3 = 3$; $u_n = u_{n-1} + u_{n-2} + u_{n-3}$
(f) $u_1 = 1$, $u_2 = 2$, $u_3 = 4$; $u_n = u_{n-1} - u_{n-3}$ (g) $u_1 = 31$; $u_n = 0.5u_{n-1} - 1$
(h) $u_1 = 2$; $u_n = u_{n-1} + n$ (i) $u_1 = 1$; $u_n = nu_{n-1}$

Alternative Definitions

1) C 2) D 3) E 4) A 5) F 6) B

Method of Differences

(a) 43, 57 (b) 63, 127 (c) 50, 81 (d) 47, 62
(e) 243, 729 (f) 184, 375 (g) 280, 396 (h) 169, 408

Miscellaneous

1) 85, 171 2) 504, 720 3) 10100
4) (a) Add two previous terms; 13, 21 OR add 1, add 2, add 3, … ; 12, 17 (other rules possible)
(b) 12, 17
(c) 4952

Sequences and Patterns

1) (a) 3, 7, 11, 15, 19 (b) $4n - 1$

2) (b) 81 (c) 28 (d) 121 (e) $B = \left(\frac{W}{4}\right)^2$ (f) $4n$ (g) n^2

4) (a) 3rd and 6th columns (b) 3rd (c) 17th row (d) 1st, 3rd, 5th columns
(e) 1st and 5th columns (f) 2nd and 5th