1.

(1) 2, 3, 5, 8, 12, …

階 1, 2, 3, 4, …

よって $b_k = k$

$$a_n = 2 + \sum_{k=1}^{n-1} k$$

$$= 2 + \frac{1}{2}n(n-1)$$

$$= \underline{\frac{1}{2}n^2 - \frac{1}{2}n + 2}$$

(2) 1, 2, 6, 15, 31, …

階 1, 4, 9, 16, …

よって $b_k = k^2$

$$a_n = 1 + \sum_{k=1}^{n-1} k^2$$

$$= 1 + \frac{1}{6}n(n-1)(2n-1)$$

$$= \underline{\frac{1}{3}n^3 - \frac{1}{2}n^2 + \frac{1}{6}n + 1}$$

(2) 10, 8, 4, −2, −10, …

階 −2, −4, −6, −8, …, −2k

$$a_n = 10 + \sum_{k=1}^{n-1}(-2k) \qquad b_k''$$

$$= 10 - 2\cdot\frac{1}{2}n(n-1)$$

$$= \underline{-n^2 + n + 10}$$

(3) 1, 2, 5, 14, 41, …

階 1, 3, 9, 27, …

よって $b_k = 3^{k-1}$

$$a_n = 1 + \sum_{k=1}^{n-1} 3^{k-1}$$

$$= 1 + \frac{3^{n-1}-1}{3-1}$$

$$= \underline{\frac{3^{n-1}+1}{2}}$$

2.

(1) $S_n = n^2 - 3n$

$a_1 = S_1 = 1 - 3 = -2$

$n \geqq 2$ のとき $a_n = S_n - S_{n-1}$

$$= (n^2 - 3n) - \{(n-1)^2 - 3(n-1)\}$$

$$= (n^2 - 3n) - (n^2 - 5n + 4)$$

$$= 2n - 4$$

これは $n=1$ のときも成り立つ

よって

$$\underline{a_n = 2n - 4}$$

(2) $S_n = 2^{n+2} - 4$

$a_1 = S_1 = 2^3 - 4$

$= 8 - 4 = 4$

$n \geqq 2$ のとき

$$a_n = S_n - S_{n-1}$$

$$= (2^{n+2} - 4) - (2^{n+1} - 4)$$

$$= 2^{n+2} - 2^{n+1}$$

$$= 2\cdot 2^{n+1} - 2^{n+1} = 2^{n+1}$$

これは $n=1$ のときも成り立つ

よって $\underline{a_n = 2^{n+1}}$