

$$1) a_{n+2} - 5a_{n+1} + 6a_n = 2^n + 23^n$$

$$a_0 = 1 \quad a_1 = -1$$

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

$$3) a_{n+2} - 3a_{n+1} + 2a_n = (n+1)2^n$$

$$4) a_{n+3} + 3a_{n+2} + 3a_{n+1} + a_n = 3^n + (n^2+1)2^n$$

$$a_{n+2} - 5a_{n+1} + 6a_n = 0 \quad \text{огвор}$$

$$q^2 - 5q + 6 = 0$$

$$q = 2, \quad q = 3$$

$$a_n = C_1 2^n + C_2 3^n \quad \text{переме огвор}$$

$$\delta u_n = \text{огвор} + \text{частное}$$

$$a_{n+2} - 5a_{n+1} + 6a_n = 2^n + \cancel{23^n} \quad 2^n (n^2 - n + 1)$$

$$a_n(\text{частное}) = 2^n \underline{a} n \quad 2^n (an^2 + bn + c) \quad \times$$

$$2^{n+2} a(n+2) - 5 \cdot 2^{n+1} a(n+1) + 6 \cdot 2^n a_n = 2^n$$

$$4a(n+2) - 10a(n+1) + 6a_n = 1$$

$$\underline{4a_n} + 8a - \underline{10a_n} - 10a + \underline{6a_n} = 1$$

$$-2a = 1$$

$$a = -1/2$$

$$a_n(\text{част}) = 2^n \left(-\frac{1}{2}\right) n = \underline{-n \cdot 2^{n-1}}$$

$$a_{n+2} - 5a_{n+1} + 6a_n = \underline{2} 3^n \quad 2^n (an^2 + bn + c)$$

$$a_n(\text{част}) = 3^n (a) n$$

$$3^{n+2} a(n+2) - 5 \cdot 3^{n+1} a(n+1) + 6 \cdot 3^n a_n = 2 \cdot 3^n$$

$$9a(n+2) - 15a(n+1) + 6a_n = 2$$

$$\underline{9a_n} + 18a - \underline{15a_n} - 15a + \underline{6a_n} = 2$$

$$3a = 2$$

$$a = 2/3 \quad a_n(\text{част}) = \underline{3^n \frac{2}{3} n}$$

$$a_n = C_1 2^n + C_2 3^n - n \cdot 2^{n-1} + 3^n \frac{2}{3} n$$

$$a_0 = 1, \quad a_1 = -1$$

$$1 = C_1 + C_2 - 0 + 0$$

$$\begin{cases} C_1 + C_2 = 1 \\ 2C_1 + 3C_2 = -2 \end{cases} \quad \begin{cases} C_1 = 5 \\ C_2 = -4 \end{cases}$$

$$-1 = 2C_1 + 3C_2 - 1 + 2$$

$$\text{Ответ} \quad a_n = 5 \cdot 2^n - 4 \cdot 3^n - n \cdot 2^{n-1} + 3^n \frac{2}{3} n$$

$$a_{n+2} - 4a_{n+1} + 4a_n = \underline{n} + 2^n$$

$$1^{n+2} (a(n+2) + b) + 2^{n+2} c(n+2)^2$$

$$n \cdot 1^n \quad 1 \cdot 2^n$$

$$a_n(\text{част}) = 1^n (an + b) + 2^n c n^2$$

$$q^2 - 4q + 4 = 0$$

$$(q-2)^2 = 0$$

$$q = 2, \quad q = 2$$

$$(q-1)^3 = 0$$

$$q = 1 \quad \text{к} \quad 3$$

$$a_n(\text{огвор}) = \underline{(C_1 + C_2 n) 2^n}$$

$$(C_1 + C_2 n + C_3 n^2) 1^n$$

$$4) a_{n+3} + 3a_{n+2} + 3a_{n+1} + a_n = 3^n + (n^2+1)2^n$$

$$q^3 + 3q^2 + 3q + 1 = 0$$

$$a_n(\text{част}) = \underline{3^n a} + \underline{2^n (bn^2 + cn + d)}$$

$$(q+1)^3 = 0$$

$$q = -1 \quad \text{к} \quad 3$$

$$a_n(\text{огвор}) = (-1)^n (C_1 n^2 + C_2 n + C_3)$$

$$(q-2)^2 (q-5)^3 (q-1) = 0$$

$$a_n(\text{огвор}) = 2^n (C_1 + C_2 n) + 5^n (C_3 + C_4 n + C_5 n^2) + 1^n C_6$$