Forma geral da relação $\boxed{a_n = (\alpha + \beta n + \gamma n^2) 2^n + (n-6) 3^{n+3}}$

3) $a_n = (\alpha + \beta n + \gamma n^2) \cdot 2^n + (n-6) 3^{n+3}$

$a_0 = 22 \qquad a_1 = 6 \qquad a_2 = 6$

$= (\alpha + \beta 0 + \gamma 0^2) \cdot 2^0 + (0-6) 3^{0+3}$

$= \alpha + (-6) \cdot 27 \Rightarrow \boxed{a_0 = \alpha - 162}$

$a_1 = (\alpha + \beta 1 + \gamma 1^2) \cdot 2^1 + (1-6) 3^{1+3}$

$= 2\alpha + 2\beta + 2\gamma + (-5) \cdot 34$

$\boxed{a_1 = 2\alpha + 2\beta + 2\gamma - 405}$

$a_2 = (\alpha + \beta 2 + \gamma 2^2) 2^2 + (2-6) 3^{2-3}$

$\boxed{a_2 = 4\alpha + 8\beta + 16\gamma - 972}$

I

$368 + 2\beta + 2\gamma - 405 = 6$

$2\beta + 2\gamma - 37 = 6$

$2\beta + 2\gamma = 43$

$\beta = \frac{43 - 2\gamma}{2}, \quad \frac{43}{2} - \gamma$

II $a_2 = 4\alpha + 8\beta + 16\gamma - 972 = 6$

$a_2 = 736 + 8\beta + 16\gamma - 972 = 6$

$= 8\beta + 16\gamma - 236 = 6$

$16\gamma = 242 - 8\left(\frac{43}{2} - \gamma\right)$

$16\gamma = 242 - 172 + 8\gamma$

$8\gamma = 70 \Rightarrow \boxed{\gamma = \frac{70}{8}}$

$\beta = \frac{43}{2} - \gamma \Rightarrow \beta = \frac{43}{2} - \frac{70}{8}$

$\boxed{\beta = 78/8}$

Logo:

$a_n = \left(184 + \frac{78}{8} n + \frac{70}{8}\right) 2^n + (n-6)^{n+3}$

$a_n = \frac{1}{8}\left(184 + \frac{78}{8} n + \frac{70}{8}\right) 2^n + (n-6)^{n+3}$

$\boxed{a_n = \left(1472 + 78n + \frac{70}{2}\right) 2^n + (n-6)^{n+3}}$

$a_0 = \alpha - 162$

$\alpha - 162 = 22$

$\boxed{\alpha = 184}$

descobrir os 10 primeiros numeros

$a_n = (11776 + 624n + 70) 2^n + (n-6)^{n+3}$

$a_3 = (11776 + 1872 + 70) 8 + (-3)^6$

$a_3 = (13718) 8 + (729)$

$\boxed{a_3 = 110473}$

$a_4 = (11776 + 2496 + 70) 16 + (2187)$

$\boxed{a_4 = 231659}$

$a_5 = (11776 + 3120 + 70) 32 + (6562)$

$\boxed{a_5 = 485473}$

$a_6 = (11776 + 3744 + 70) 64 + (19683)$

$\boxed{a_6 = 1017443}$

$a_7 = (11776 + 4368 + 70) 128 + (59049)$

$\boxed{a_7 = 2134441}$

$a_8 = (11776 + 4992 + 70) 240 + (177147)$

$\boxed{a_8 = 4218267}$

$a_9 = (11776 + 5616 + 70) 480 + (531441)$

$\boxed{a_9 = 8913201}$

Math Discreto

Nome: Kerby Lovince

a) $a_n = 6a_{n-1} - 12a_{n-2} + 8a_{n-3} + n3^n$

$r^3 \cdot 6r^2 + 12r + 8 \Rightarrow$ polynomio

$r^3 - 6r^2 + 12r - 8 = 0$ $r = 2$ é raiz

$$\begin{array}{r|rrrr} 2 & 1 & -6 & 12 & -8 \\ \hline & 1 & -4 & 4 & 0 \end{array} \Rightarrow (r^2 - 4r + 4)\cdot(r-2) = r^3 - 6r^2 + 12r - 8$$

$$r = \frac{4 \pm \sqrt{16 - 4\cdot 1\cdot 4}}{2} \Rightarrow \frac{4}{2} \Rightarrow r' = 2,\ r'' = 2$$

2 é raiz de mult de 3, $a_n = (2 + 8n + 8n^2)\cdot 2n$

II solução geral

$F(n) = n\cdot 3^n$

$\Rightarrow (a_n)^p = (\alpha_0 + \alpha_1 n)\cdot 3^n$

como a recorrencia tem grau 3:

$a_n = (\alpha_0 + \alpha_1 n)3^n$

$a_{n-1} = (\alpha_0 + \alpha_1(n-1))\cdot 3^{n-1}$

$a_{n-2} = (\alpha_0 + \alpha_1(n-2))\cdot 3^{n-2}$

$a_{n-3} = (\alpha_0 + \alpha_1(n-3))\cdot 3^{n-3}$

$\Big\}\ a_n = 6a_{n-1} - 12a_{n-2} + 8a_{n-3} + n\cdot 3^n$

$\Rightarrow (\alpha_0 + \alpha_1 n)\cdot 3^n = 6(\alpha_0 + \alpha_1(n-1))\cdot 3^{n-1} - 12(\alpha_0 + \alpha_1(n-2))\cdot 3^{n-2} + 8(\alpha_0 + \alpha_1(n-3)) \cdot 3^{n-3} + n\cdot 3^n$

$\Rightarrow (\alpha_0 + \alpha_1 n)\cdot 3^n = \frac{6\cdot 3^n}{3}(\alpha_0 + \alpha_1 n - \alpha_1) - \frac{12\cdot 3^n}{3^2}(\alpha_0 + \alpha_1 - 2\alpha_1) + \frac{8\cdot 3^n}{3}(\alpha_0 + \alpha_1 - 3\alpha_1) + n\cdot 3^n$

$\Rightarrow (\alpha_0 + \alpha_1 n = 2(\alpha_0 + \alpha_1 n - \alpha_1) - \frac{4}{3}(\alpha_0 + \alpha_1 n - 2\alpha_1) + \frac{8}{27}(\alpha_0 + \alpha_1 - 3\alpha_1) + n$

$\Rightarrow \cancel{\alpha_0} = 2\alpha_0 \cdot 2\alpha_1 - \frac{4}{3}\alpha_0 + \frac{4\cdot 2}{3}\alpha_1 + \frac{8}{27}\alpha_0 - \frac{3\cdot 8}{27}\alpha_1$

$\frac{\cancel{\alpha_0}}{27} = \frac{54\alpha_0 - 34\alpha_1 - 36\alpha_0 + 70\alpha_1 + 8\alpha - 24\alpha_1 -}{27}$

$\cancel{\Rightarrow 27\alpha_0 = 26\alpha_0 - 6\alpha_1} \Rightarrow$

$27\alpha_1 - 34\alpha_1 + 36\alpha_1 - 8\alpha_1 = 27$

$\boxed{\alpha_1 = 27}$, $\alpha_0 = -6\cdot 27 \Rightarrow \boxed{\alpha_0 = -162}$ $(a_n)^p = (-162 + 27n)^{n+1}$