Resolver

$a_n = a_{n-1} + 6a_{n-2} + 5^n$
$a_0 = 3$
$a_1 = 6$

Resolución: x2 -x -6 = 0 → raíces 3 y -2

Solución de la homogénea:
$a_n = C_1(-2)^n + C_2(3)^n$

Solución Particular:

	Tabla "mágica"
k	c
n	an+b
n^2	$an^2 + bn + c$
a^n	$k.a^n$

La solución particular será $a_n = k.5^n$
$k.5^n = k.5^{n-1} + 6.k.5^{n-2} + 5^n$
$k.5^2 = k.5^1 + 6.k + 5^2$
25k=5k+6k+25
14k=25
$k= \frac{25}{14}$

Solución de la no homogénea:
$a_n = C_1\ (-2)^n + C_2\ (3)^n + \frac{25}{14} . 5^n$
Ahora vamos a calcular las constantes C_1 y C_2
$a_0 = C_1\ (-2)^0 + C_2\ (3)^0 + \frac{25}{14} . 5^0 = 0$
$a_1 = C_1\ (-2)^1 + C_2\ (3)^1 + \frac{25}{14} . 5^1 = 6$
$C_1 + C_2 + \frac{25}{14} = 3$ → ~~$2C_1$~~ $+ 2C_2 + \frac{50}{14} = 3$
$-C_1 + 3\ C_2 + \frac{25}{14} = 6$ → ~~$-2C_1$~~ $+ 3C_2 + \frac{25}{14} = 6$

$5C_2 + \frac{175}{14} = 12$
$5C_2 = \frac{12}{1} - \frac{175}{14}$
$5C_2 = \frac{168-175}{14}$
$5C_2 = \frac{-7}{14}$
$C_2 = \frac{-1}{10}$

$C_1 - \frac{1}{10} + \frac{25}{14} = 3$

$C_1 = 3 + \frac{1}{10} - \frac{25}{14}$

$C_1 = \frac{210 + 7125}{70}$

$C_1 = \frac{92}{70} = \frac{46}{35}$

$a_n = \frac{46}{35} (-2)^n - \frac{1}{10} (3)^n + \frac{25}{14} . 5^n$

Verificación

$a_0 = \frac{46}{35} (-2)^0 - \frac{1}{10} (3)^0 + \frac{25}{14} . 5^0$

$a_0 = \frac{46}{35} - \frac{1}{10} + \frac{25}{14}$

$a_0 = \frac{92 - 7 + 125}{70} = 3$

$a_1 = \frac{46}{35} (-2)^1 - \frac{1}{10} (3)^1 + \frac{25}{14} . 5^1$

$a_1 = -\frac{92}{35} - \frac{3}{10} + \frac{125}{14}$

$a_1 = \frac{-185 - 21 + 625}{70} = \frac{420}{70}$

$a_2 = \frac{46}{35} (-2)^2 - \frac{1}{10} (3)^2 + \frac{25}{14} . 5^2$

$a_2 = \frac{184}{35} - \frac{9}{10} + \frac{625}{14} = 49$

para para n=2

$a_2 = a_1 + 6\ a_0 + 5^2$

$a_2 = 6 + 6.3 + 25$

$a_2 = 49$

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