(2)

$$2a_{n+2} - 11a_{n+1} + 5a_n = 0 \qquad n>0$$

$$a_0 = 2, \quad a_1 = -8$$

$$2x^2 - 11x + 5 = 0$$

$x_1 = \frac{1}{2} \rightarrow r_1$

$r_1 \neq r_2$

$x_2 = 5 \rightarrow r_2$

Formula

$$a_n = K_1 r_1^n + K_2 r_2^n$$

$2 = K_1 + K_2$ ① multiplicamos (-5)

$-8 = \frac{1}{2} K_1 + 5K_2$ ②

$(-5) \rightarrow -10 = -5K_1 - 5K_2$

$-8 = \frac{1}{2}K_1 + 5K_2$

$-18 = -\frac{9}{2} K_1$

$K_1 = 4$ ③

Remplazamos ③ en ① ! Ahora

$2 = 4 + K_2$

$-2 = K_2$

$a_n = 4\left(\frac{1}{2}\right) + 2(5)^n$

(3)

$3a_{n+1} - 2a_n + a_{n-1} = 0 \qquad n > 1$

$a_0 = 7, \quad a_1 = 3$

$3a_{n+1} - 2a_n - a_{n-1} = 0$

$3x^2 - 2x - 1 = 0$

$x_1 = -\frac{1}{3} \rightarrow r_1 \qquad r_1 \neq r_2$

$x_2 = 1 \rightarrow r_2$

Formula:

$a_n = K_1 r_1^n + K_2 r_2^n$

$7 = -\frac{1}{3} K_1 + K_2$ (1) multiplicamos (-7)

$3 = \frac{1}{9} K_2 + K_2$ (2)

$-7 = \frac{7}{3} K_1 - K_2$

$3 = \frac{1}{9} K_1 + K_2$

$-4 = \frac{4}{9}$

$K_1 = -9$

③ en ①

$7 = -\frac{1}{3}(-9) + K_2$

$7 = 3 + K_2$

$K = 4$

Ahora

$a_n = -9\left(-\frac{1}{3}\right)^n + 4(1)^n$

④

$a_{n+2} + a_n = 0$ $\quad n > 0$

$a_0 = 0, \; a_1 = 3$

$x^2 + x = 0$

$x_1 = -1 \rightarrow r_1$ $\quad r_1 = r_2$

Formula

$a_n = K r_1^n + K_2 n r_1^n$

$K_1 = 0$ ①

$3 = -K_1 - K_2$ ②

Sustituimos ① en ② Ahora

$3 = -1(0) - K_2$

$K_2 = -3$

$a_n = 0(-1)^n - 3n(-1)^n$