Scribe

Relación recurrencia

- Encuentre la relación de recurrencia, con una condición inicial, que determine las sgte progresiones

d) $7, \frac{14}{5}, \frac{28}{25}, \frac{56}{125}$

Relación: $a_n = \frac{2}{5} \cdot a_{n-1}$

a_n = término n

a_{n-1} = término anterior

$\frac{2}{5}$ = Razón de la progresión

Condición inicial $\rightarrow a_1 = 7$

Término 100 $\quad a_n = 7 \cdot \left(\frac{2}{5}\right)^{n-1}$

$$a_{100} = 7\left(\frac{2}{5}\right)^{100-1} = 7\left(\frac{2}{5}\right)^{99}$$

$$a_{100} = 2.81214577453323e-39$$

$a_n = 7a_{n-1} - 10a_{n-2},\ n \geq 2$

$a_0 = 2\ ;\ a_1 = 1$

$a_n - 7a_{n-1} + 10a_{n-2} = 0$

$x^2 - 7x + 10 = 0$

$(x-5)(x-2)$

$x = 5 \qquad x = 2$

$a_n = k_1 r_1^n + k_2 r_2^n$

$2 = k_1 + k_2 \quad (-2)$

$1 = 5k_1 + 2k_2$

$-3 = 3k_1$

$k_1 = -3/3$

$k_1 = -1$

$2 = -1 + k_2$

$k_2 = 3$

$a_n = -1 \cdot 5^n + 3 \cdot 2^n$

$a_{1879} = -1 \cdot 5^{1879} + 3 \cdot 2^{1879}$

$$a_{n+2} + 4a_n = 0, \quad n \geq 0, \quad a_0 = a_1 = 1$$

$$r^2 + 4r = 0$$

Factorizando

$$r(r + 4) = 0$$

$$r = 0 \quad (1)$$

$$r = -4 \quad (2)$$

$$a_n = C_1(0)^n + C_2(-4)^n$$

Para $n = 0$

$$1 = C_1(0)^0 + C_2(4)$$

$$1 = C_1 + C_2$$

Para $n = 1$

$$1 = C_1(0)^1 + C_2(-4)^1 \qquad C_1 = 1$$

$$1 = 0 + (-4)C_2 \qquad C_2 = 1/4$$

$$a_n = 1 - 1/4(-4)^n$$

$$a_{151145} = 1 - 1/4(-4)^{151145}$$

$$a_{151145} = 1 - 1/4 \times 2685158878 \times 10^{91410}$$

$$a_{151145} \approx 1 - 6.712897195 \times 10^{91409}$$