

Examen

Mathem Gómez Prueba
01/11/2020

Punto 1.

primer nombre: Néikthán 7 letras

$$a_0 = 7$$

$$n \geq 1$$

primer apellido: Gómez 5 letras

$$a_1 = 5$$

$$7a_{n-2} + 2a_n + 3a_{n-2} = 0$$

$$2a_n + 7a_{n-2} + 3a_{n-2} = 0$$

$$2x^2 + 7x + 3 = 0$$

$$x_1 = -\frac{1}{2} \quad x_2 = -3$$

$$r_1 = -\frac{1}{2} \quad r_2 = -3$$

no son iguales, se usa $a_n = k_1 r_1^n + k_2 r_2^n$

$$a_n = k_1 \left(-\frac{1}{2}\right)^n + k_2 (-3)^n$$

$$a_0 = 7 = k_1 \left(-\frac{1}{2}\right)^0 + k_2 (-3)^0 = k_1 + k_2$$

$$a_1 = 5 = k_1 \left(-\frac{1}{2}\right)^1 + k_2 (-3)^1 = -\frac{1}{2}k_1 - 3k_2$$

$$k_1 = \frac{52}{5}$$

$$k_2 = -\frac{17}{5}$$

Prueba:

$$a_0 = \frac{52}{5} + \left(-\frac{17}{5}\right) = 7$$

$$a_1 = -\frac{1}{2} \left(\frac{52}{5}\right) - 3 \left(-\frac{17}{5}\right) = 5$$

Para $n = 1500$

$$a_{1500} = k_1 \left(-\frac{1}{2}\right)^{1500} + k_2 (-3)^{1500} = -1.6 \times 10^{716}$$

Solution by Cramer's rule

$$\begin{cases} x_1 + x_2 = 7 \\ -\frac{1}{2}x_1 - 3x_2 = 5 \end{cases}$$
$$A = \begin{bmatrix} 1 & 1 \\ -\frac{1}{2} & -3 \end{bmatrix} = \frac{-5}{2}$$

► Details

$$A_1 = \begin{bmatrix} 7 & 1 \\ 5 & -3 \end{bmatrix} = -26;$$

► Details

$$A_2 = \begin{bmatrix} 1 & 7 \\ -\frac{1}{2} & 5 \end{bmatrix} = \frac{17}{2};$$

► Details

$$x_1 = A_1 / A = \frac{-26}{\frac{-5}{2}} = \frac{52}{5}$$
$$x_2 = A_2 / A = \frac{\frac{17}{2}}{\frac{-5}{2}} = \frac{-17}{5}$$

Answer:

$$x_1 = \frac{52}{5}$$
$$x_2 = \frac{-17}{5}$$

Punto 3: A, B, C, D, E, F y G

si importa el orden, si entran todas, no se repiten -

(1) primero se halla el total:

$$7! = 5040$$

(2) palabras en las que A y B no
estén juntas

se toma
AB como
uno

$$6! = 720$$

$$\underbrace{6}_1 \underbrace{5}_2 \underbrace{4}_3 \underbrace{3}_4 \underbrace{2}_5 \underbrace{1}_6 \underbrace{1}_7 = 720$$

$$2 \cdot 720 = 1440$$

al ser AB o BA
se multiplica por 2

(1) - (2) = palabras donde no están ^W juntas las letras,

$$5040 - 1440 = \boxed{3600}$$