Punto 1

- $x_{n+1} = 4x_n - x_n^2$ → Relación recursiva
- Condición Inicial → $x_0 = 4\,sen^2(\theta)$

$x_1 = 4x_0 - x_0^2$

$x_1 = 4(4\,sen^2(\theta)) - 16\,sen^4(\theta)$

$x_1 = 16\,sen^2(\theta) - 16\,sen^4(\theta)$

$x_1 = 16\,sen^2(\theta)(1 - sen^2(\theta))$

$x_1 = 16\,sen^2(\theta)\cos^2(\theta)$ ⇒ $sen(2\theta) = 2\,sen(\theta)\cos(\theta)$

$x_1 = 4\,sen^2(2\theta)$

Para x_2:

$x_2 = 4x_1 - x_1^2$

$x_2 = 16\,sen^2(2\theta) - 16\,sen^4(2\theta)$

$x_2 = 16\,sen^2(2\theta)(1 - sen^2(2\theta))$

$x_2 = 16\,sen^2(2\theta)\cos^2(2\theta)$ • $sen(2A) = 2\,sen(A)\cos(A)$

$A = 2\theta$

$x_2 = 4\,sen^2(4\theta)$

- Generalización de la fórmula

$x_0 = 4\,sen^2(\theta)$

$x_1 = 4\,sen^2(2\theta)$

$x_2 = 4\,sen^2(4\theta)$

$x_3 = 4\,sen^2(8\theta)$

$x_n = 4\,sen^2(2^n\theta)$

Por lo tanto la recursiva:

$x_{n+1} = 4\,sen^2(2^{n+1}\theta)$

- $x_{n+1} = 4x_n - 4x_n^2$

$x_0 = \text{sen}^2(\theta)$

$x_1 = 4x_0 - 4x_0^2$

$x_1 = 4(\text{sen}^2(\theta)) - 4\,\text{sen}^4(\theta)$

$x_1 = 4\,\text{sen}^2(\theta)(1 - \text{sen}^2(\theta))$

$x_1 = 4\,\text{sen}^2(\theta)\cos^2(\theta)$

- $\text{sen}(2\theta) = 2\,\text{sen}(\theta)\cos(\theta)$

$x_1 = \text{sen}^2(2\theta)$

$x_2 = 4x_1 - 4x_1^2$

$x_2 = 4\,\text{sen}^2(2\theta) - 4\,\text{sen}^4(2\theta)$

$x_2 = 4\,\text{sen}^2(2\theta)(1 - \text{sen}^2(2\theta))$

$x_2 = 4\,\text{sen}^2(2\theta)\cos^2(2\theta)$

$x_2 = \text{sen}^2(4\theta)$

- $x_0 = \text{sen}^2(\theta)$
- $x_1 = \text{sen}^2(2\theta)$
- $x_2 = \text{sen}^2(4\theta)$
- $x_3 = \text{sen}^2(8\theta)$

$x_{n+1} = \text{sen}^2(2^{n+1}\theta)$