1) $X_{n+1} = 4X_n - X_n^2$ $\quad X_0 = 4Sen^2(\theta)$

$X_{n+1} = X_n(4 - X_n)$

$X_1 = 4Sen^2(\theta)(4 - 4Sen^2(\theta)) = 16Sen^2(\theta)(1 - Sen^2(\theta))$

Aplicando identidad trigonométrica:

$X_1 = 16sen^2(\theta)cos^2(\theta)$

Por la propiedad de ángulo doble sabemos que:

$Sen(2\theta) = 2Sen(\theta)cos(\theta)$

Elevando al cuadrado a ambos lados de la igualdad:

$Sen^2(2\theta) = 4Sen^2(\theta)cos^2(\theta)$

Multiplicando por 4 a ambos lados:

$4Sen^2(2\theta) = 16sen^2(\theta)cos^2(\theta) = X_1.$

$X_2 = 4Sen^2(2\theta)(4 - 4Sen^2(2\theta)) = 16Sen^2(2\theta)(1 - Sen^2(2\theta))$

$X_2 = 16Sen^2(2\theta)Cos^2(2\theta)$

Aplicando las mismas propiedades:

$X_2 = 4Sen^2(4\theta)$

$$X_3 = 4\operatorname{Sen}^2(4\theta)(4 - 4\operatorname{Sen}^2(4\theta))$$

$$X_3 = 16\operatorname{Sen}^2(4\theta)(1 - \operatorname{Sen}^2(4\theta)) = 16\operatorname{Sen}^2(4\theta)\cos^2(4\theta)$$

$$X_3 = 4\operatorname{Sen}^2(8\theta)$$

$$X_4 = 4\operatorname{Sen}^2(8\theta)(4 - 4\operatorname{Sen}^2(8\theta)) = 16\operatorname{Sen}^2(8\theta)\cos^2(8\theta)$$

$$X_4 = 4\operatorname{Sen}^2(16\theta)$$

Recapitulando los resultados y completando la secuencia:

$$X_0 = 4\operatorname{Sen}^2(\theta) = 4\operatorname{Sen}^2(2^0\theta)$$
$$X_1 = 4\operatorname{Sen}^2(2\theta) = 4\operatorname{Sen}^2(2^1\theta)$$
$$X_2 = 4\operatorname{Sen}^2(4\theta) = 4\operatorname{Sen}^2(2^2\theta)$$
$$X_3 = 4\operatorname{Sen}^2(8\theta) = 4\operatorname{Sen}^2(2^3\theta)$$
$$X_4 = 4\operatorname{Sen}^2(16\theta) = 4\operatorname{Sen}^2(2^4\theta)$$
$$\vdots$$
$$X_n = 4\operatorname{Sen}^2(2^n\theta)$$

$$\boxed{X_{n+1} = 4\operatorname{Sen}^2(2^{n+1}\theta)}$$

$$X_{n+1} = 4X_n - 4X_n^2 \qquad X_0 = Sen^2(\theta)$$

$$X_{n+1} = 4X_n(1-X_n)$$

$$X_1 = 4Sen^2(\theta)(1-Sen^2(\theta)) = 4Sen^2(\theta)\cos^2(\theta)$$

$$X_1 = Sen^2(2\theta)$$

$$X_2 = 4Sen^2(2\theta)(1-Sen^2(2\theta)) = 4Sen^2(2\theta)\cos^2(2\theta)$$

$$X_2 = Sen^2(4\theta)$$

$$X_3 = 4Sen^2(4\theta)(1-Sen^2(4\theta)) = 4Sen^2(4\theta)\cos^2(4\theta)$$

$$X_3 = Sen^2(8\theta)$$

Retomando la secuencia y completando:

$$X_0 = Sen^2(\theta) = Sen^2(2^0\theta)$$
$$X_1 = Sen^2(2\theta) = Sen^2(2^1\theta)$$
$$X_2 = Sen^2(4\theta) = Sen^2(2^2\theta)$$
$$X_3 = Sen^2(8\theta) = Sen^2(2^3\theta)$$
$$\vdots$$
$$X_n = Sen^2(2^n\theta)$$

$$\boxed{X_{n+1} = Sen^2(2^{n+1}\theta)}$$