ⓐ $\frac{\partial u}{\partial t} = D\frac{\partial^2 u}{\partial x^2} - u(u-a)(1-u) + w$

Discretizando: $\frac{u_{\ell+1,i} - u_{\ell,i}}{\Delta t} = \frac{D}{\Delta x^2}\left[u_{\ell,i+1} - 2u_{\ell,i} - u_{\ell,i-1}\right] - u_{\ell,i}(u_{\ell,i} - a)\wedge(1-u_{\ell,i}) + v_{i,\ell}$

$u_{\ell+1,i} = u_{\ell,i} + \left(\frac{D\Delta t}{\Delta x^2}\right)(u_{\ell,i+1} - 2u_{\ell,i} + u_{\ell,i-1}) - u_{\ell,i}\Delta t(u_{\ell,i} - a)(1-u_{\ell,i}) - w_{i,\ell}\Delta t$

$u_{\ell+1,i} = u_{\ell,i} + \frac{D\Delta t}{\Delta x^2}(2\cos(k\Delta x) - 2)u_{\ell,i} - \Delta t(u_{\ell,i} - a)(1-u_{\ell,i})u_{\ell,i} - w_{i,\ell}\Delta t$

Para la parte que varía vemos:

$$\underbrace{\left(1 + \frac{D\Delta t}{\Delta x^2}(2\cos(k\Delta x) - 2)\right)}u_{\ell,i}$$

El mayor valor que puede obtener es para $\cos(k\Delta x) = 0$

Debe ser menor a 1 y $D > 0$ ∴ $1 - 2\frac{D\Delta t}{\Delta x^2} < 1$

$$-1 < 2\frac{D\Delta t}{\Delta x^2}$$

$$\Rightarrow \frac{1}{2} > \frac{D\Delta t}{\Delta x^2} = \lambda$$