RETIFICAÇÃO

(3) $$x_P = \left(\frac{k_1}{A_0}\right) \int_0^{\infty} A(\tau)\, d\tau$$

$$x_Q = 1 - x_P$$

$$\int_0^{\infty} A(\tau)\, d\tau$$

USAR $z = e^{-k_1 t}$

$$-k_1 e^{-k_1 t}\, dt = dz$$

$$\int_0^{\infty} A(\tau)\, d\tau = \left(\frac{1}{k_1}\right) \int_0^1 \frac{dz}{A_0^{-1} + \alpha(1-z)} \qquad \alpha = \frac{2k_2}{k_1}$$

Resolvendo temos

$$\int_0^{\alpha} A(\tau)\, d\tau = \frac{1}{k_1 \alpha} \ln\left(\frac{A_0^{-1} + \alpha}{A_0^{-1}}\right) = \frac{1}{k_1 \alpha} \ln\left(1 + \alpha A_0\right)$$

Assim:

$$\boxed{x_P = \left(\frac{k_1}{2k_2 A_0}\right) \ln\left(1 + \frac{2k_2 A_0}{k_1}\right)}$$

$$\boxed{\frac{2k_2 A_0}{k_1} = \beta}$$

$$\boxed{x_P = \ln\left(1 + \beta\right)^{1/\beta}}$$