Equation

$$\mathbb{E}[p(n+1)|p(n)] = p_1^2(-k_R + k_R C_2 + k_R - k_R C_1 + k_p C_1 - k_p C_2)$$
$$+ p_1(\cancel{k_R} - k_R C_2 + 1 - C_1 - \cancel{k_R} + k_R C_1 - C_2 + 2k_p C_2)$$
$$+ (C_2 - k_p C_2)$$

$\underline{k_R = k_p = k}$. Quadratic terms disappear

$$E\left[p_1(n+1) \middle| p\right] = p_1\left[-k C_2 + 1 - C_1 + k C_1 - C_2 + 2 k C_2\right] + C_2(1-k)$$

$$= p_1\left[(1 - C_1 - C_2) + k(C_1 + C_2)\right] + C_2(1-k)$$

$p_1(n+1) \to p_1(\infty)$

$$p_1(\infty)\left[\cancel{1} - (1 - C_1 + C_2) - k(C_1 + C_2)\right] = C_2(1-k)$$

$$p_1(\infty)\left[(C_1 + C_2) - k(C_1 + C_2)\right] = p_1(\infty)\left[(1-k)(C_1 + C_2)\right] = C_2(1-k) \Longrightarrow p_1(\infty) = \frac{C_2}{C_1 + C_2} \quad \#$$