

一般解 $x = \frac{CAe^{kAt}}{1 + Ce^{kAt}}$ に初期条件
 $t = 0, x = x_0$

を代入

$$x_0 = \frac{CA}{1 + C}$$

$$x_0(1 + C) = CA \quad \therefore \quad C = \frac{x_0}{A - x_0}$$

よって

$$x = \frac{\frac{x_0}{A - x_0} A e^{kAt}}{1 + \frac{x_0}{A - x_0} e^{kAt}} = \frac{x_0 A e^{kAt}}{A - x_0 + x_0 e^{kAt}}$$