

$$CFR_n = 1 - (1 - \beta)^n$$

$$CFR_n = \sum \beta (1 - \beta)^n$$

等比数列の和の公式

$$S_n = a \frac{1 - r^n}{1 - r} \quad (r \neq 1)$$

$$\begin{aligned} \sum \beta (1 - \beta)^n &= \beta \cdot \frac{1 - (1 - \beta)^n}{1 - (1 - \beta)} \\ &= \beta \cdot \frac{1 - (1 - \beta)^n}{\beta} \\ &= 1 - (1 - \beta)^n \end{aligned}$$