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

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

等比数列の和の公式

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

$$\sum \beta(1-\beta)^n = \beta \cdot \frac{1-(1-\beta)^n}{1-(1-\beta)}$$

$$= \beta \cdot \frac{1-(1-\beta)^n}{\beta}$$

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