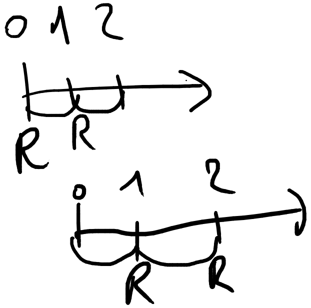
RENDITE:

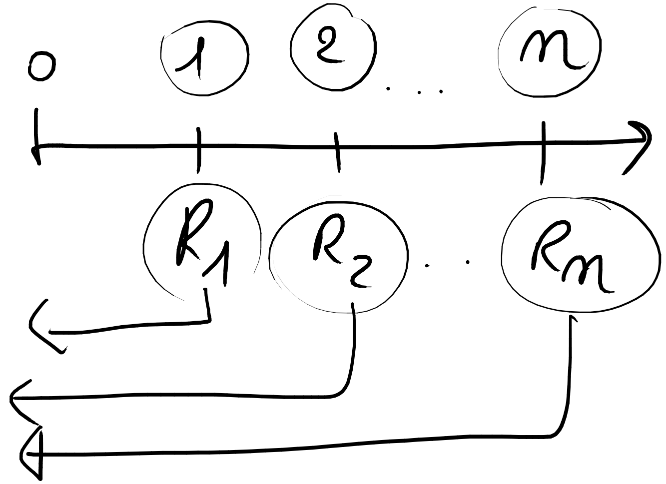
- classificazione
  - importo RATA → costante
  - N° rate → N° finito / N° infinito
  - periodicità → periodica / non periodica
  - scadenza rata → anticipata / posticipata
  - decorrenza → immediata / differita



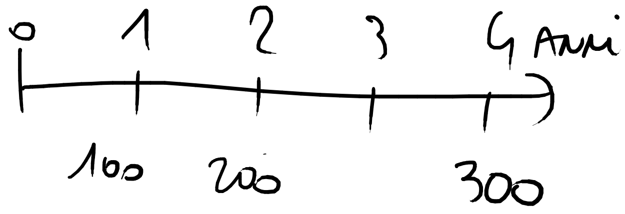
N° RATE ∞

- VALORE ATTUALE
  - caso generale
  - RATA COSTANTE
    - ANTICIP
    - POST
- MONTANTE
- Relazione tra $a_{\overline{n}|i}$, $s_{\overline{n}|i}$, $\ddot{s}_{\overline{n}|i}$, $\alpha_{\overline{n}|i}$
- CALCOLO QUANTITÀ CARATTERISTICHE
  - RATA
  - TASSO int.

VALORE ATTUALE :



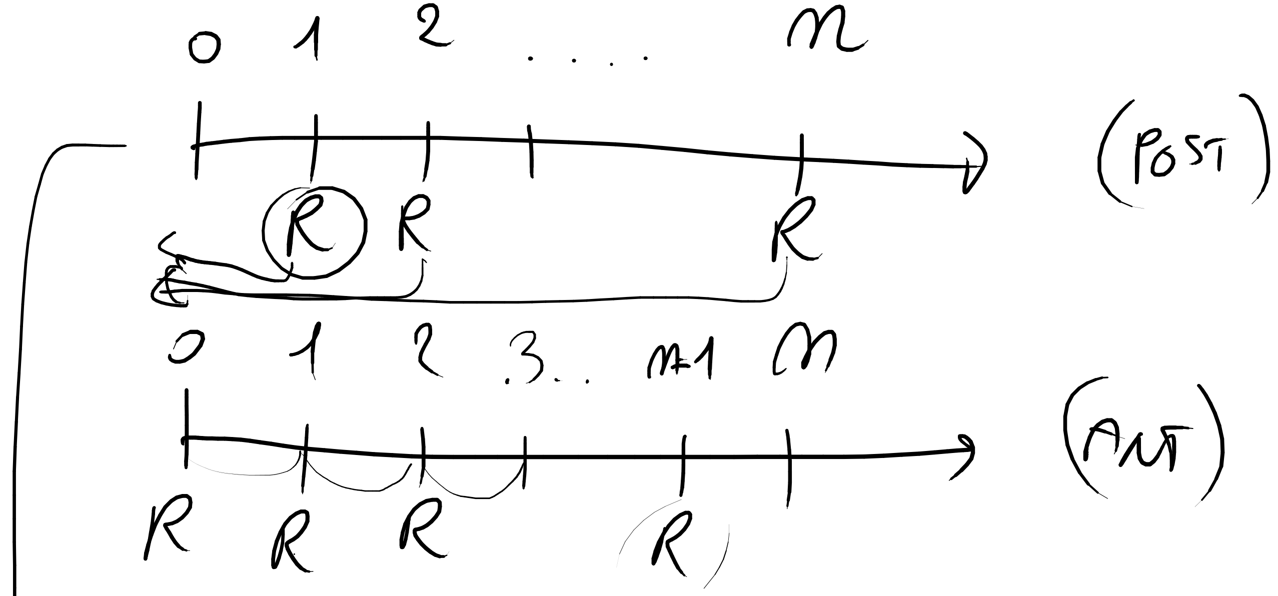
$$V.A. = \frac{R_1}{(1+i)} + \frac{R_2}{(1+i)^2} + \dots + \frac{R_n}{(1+i)^n}$$



$i_A = 8\%$

$$V.A. = \frac{100}{1+0,08} + \frac{200}{(1+0,08)^2} + \frac{300}{(1+0,08)^4}$$

CASO RATA COSTANTE: (POSTICIPATA)
EQUIINTERVALLATA



$$U.A. = R(1+i)^{-1} + R(1+i)^{-2} + \dots + R(1+i)^{-n}$$

$$U.A. = R(1+i)^{-1}\left[1 + (1+i)^{-1} + \dots + (1+i)^{-(n-1)}\right]$$

RIDOTTA n-esima serie geometrica $\left[\dfrac{1-v^{n}}{1-v}\right]$

$$V.A. = \frac{R}{(1+i)} \cdot \left[\frac{1-\dfrac{1}{(1+i)^{n}}}{1-\dfrac{1}{(1+i)}}\right]$$

$$\downarrow$$

$$(1+i)^{-1} < 1$$

$$\frac{v^{n}-1}{v-1} \quad v > 1$$

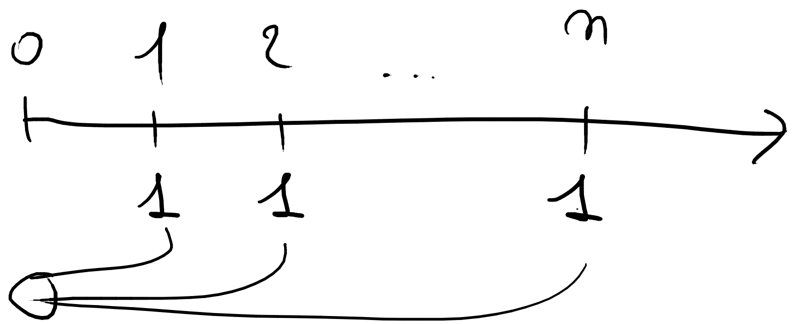
$$V.A. = \frac{R}{(1+i)}\left[\frac{1-(1+i)^{-n}}{\dfrac{\cancel{1}+i-\cancel{1}}{(1+i)}}\right]$$

$$V.A. = \frac{R}{\cancel{(1+i)}}\left[\frac{1-(1+i)^{-n}}{i}\right]\cancel{(1+i)} = R \cdot a_{\overline{n}|i}$$

$$a_{\overline{n}|i} = \frac{1-(1+i)^{-n}}{i}$$

N° RATE

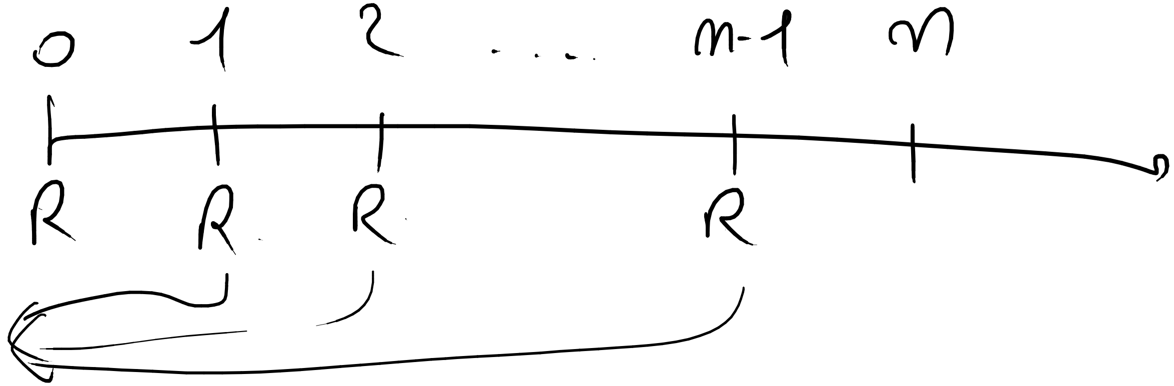
TASSO interesse



$V.A. = 1 \cdot a_{\overline{n}|i}$

è il V.A. Rendita rate costante POSTICIPATA PARI A 1€

Rendita anticipata RATA COSTANTE equintervallata.



$$V.A. = R \boxed{a_{\overline{n}|i} \cdot (1+i)}$$ ANTICIPATA

$$\ddot{a}_{\overline{n}|i} = a_{\overline{n}|i} \cdot (1+i)$$

$\downarrow$

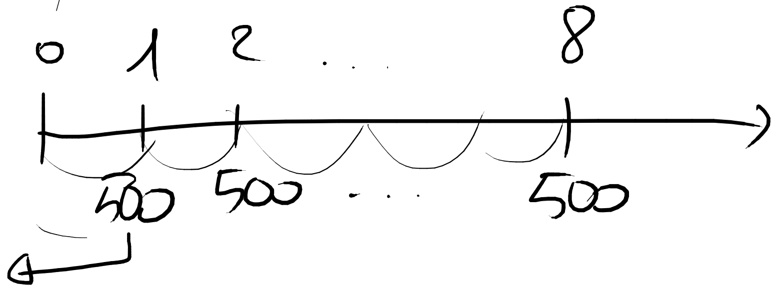
V.A. Rendita anticipata RATA = 1

V.A. ANTICIPATA = V.A. POST $(1+i)$

es: Rendita $n = 8$ Rate trimestrali

$i = 0{,}01$ trimestrale

(post) RATA = 500 €



$$V.A. = \frac{500}{1+0{,}01} + \frac{500}{(1+0{,}01)^2} + \dots + \frac{500}{(1+0{,}01)^8} =$$

$$V.A. = 500\, a_{\overline{8|}0{,}01} = 500\,\frac{1-(1+0{,}01)^{-8}}{0{,}01} =$$

$$\boxed{i_2 = \text{rem} = 2\%} \rightarrow (1+i_2)^2 = (1+i_4)^4 \qquad i_4 = \sqrt[2]{(1+i_2)} - 1$$

- TASSO ANNUO CONVERTIBILE TRIMESTRALMENTE

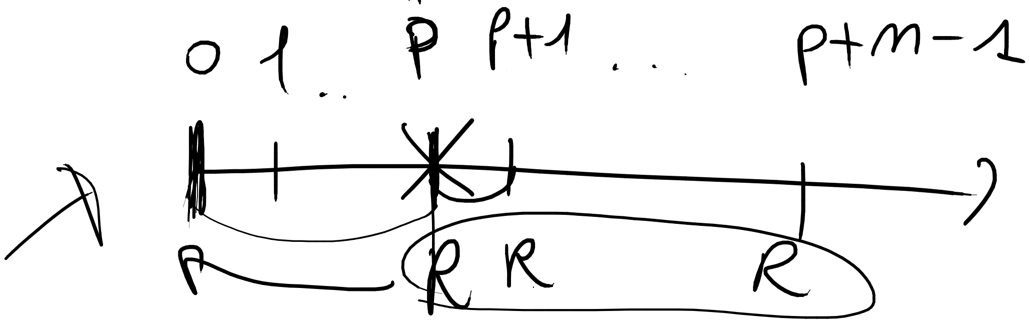
$$\frac{J_4}{4} = i_4 \qquad \frac{12\%}{4} = 3\% = i_4$$

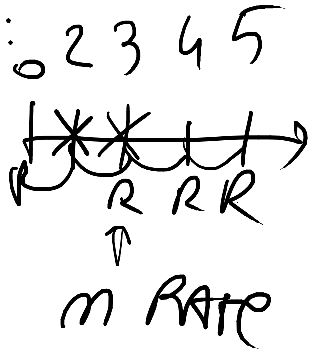
- TASSO ANNUO CONVERTIBILE SEMESTRALMENTE

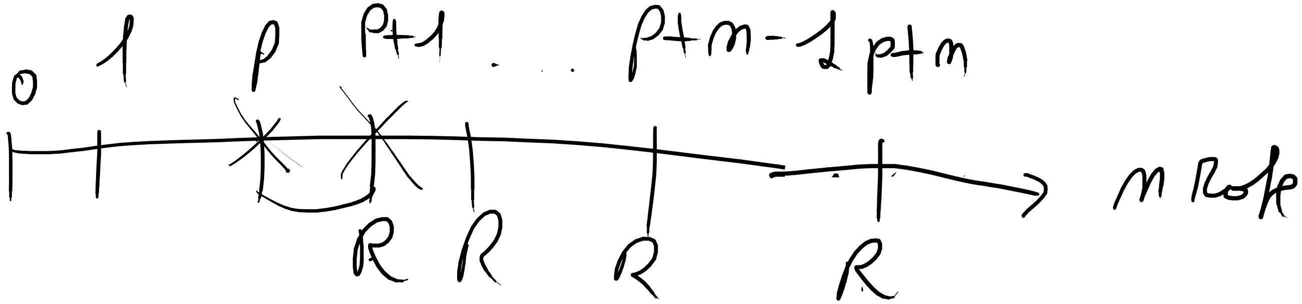
$$\frac{J_2}{2} = i_2 \qquad \frac{12\%}{2} = 6\% = i_2$$

$$(1+i_4)^4 = (1+i_2)^2 \qquad (1+i_4)^4 = (1+6\%)^2$$

Rendite differita di p-periodi :







$$V.A.(0) = \boxed{R\,\frac{1-(1+i)^{-m}}{i}(1+i)}\,(1+i)^{-p}$$

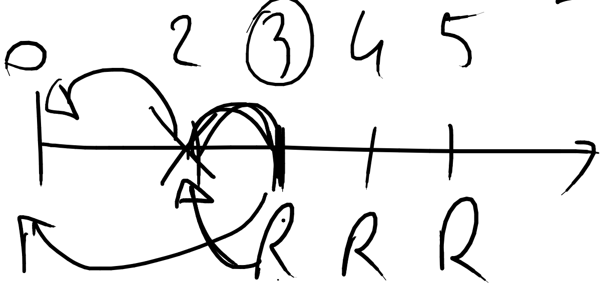
VALORE Rendite imp

CONSIDER

$$V.A.(0)\ \text{Rendite}\ \underline{\text{ant}} = R\left[\frac{1-(1+i)^{-n}}{i}(1+i)\right](1+i)^{-p}$$

CONSIDER

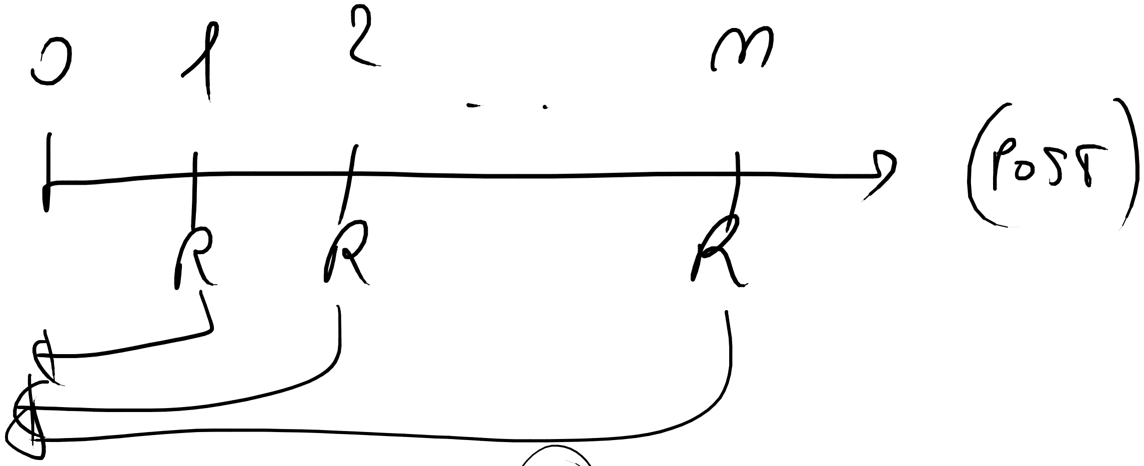
$$V.A.(0) = \text{Rend}\ \underline{\text{post}} = R\left[\frac{1-(1+i)^{-n}}{i}\right](1+i)^{-(p-1)}$$



$$V.A. = R\left[\frac{1-(1+i)^{-n}}{i}\right]\underline{(1+i)^{-2}}$$

$$V.A. = R\left[\frac{1-(1+i)^{-3}}{i}(1+i)\right](1+i)^{-3}$$

Rendita perpetua: N° RATE $\to +\infty$



$$V.A. = R\left[\frac{1-(1+i)^{-n}}{i}\right] \quad \text{(POST)}$$

$$V.A.\ R\left[\frac{1-(1+i)^{-n}}{i}\right](1+i) \quad \text{(ANT)}$$

$$V.A. = \lim_{n \to +\infty} \left[R \left[\frac{1 - \frac{1}{(1+i)^n}}{i} \right] \right] = \frac{R}{i}$$

$\downarrow$

(POST)

$$\text{(ANT)} \quad V.A. = \frac{R}{i}(1+i)$$

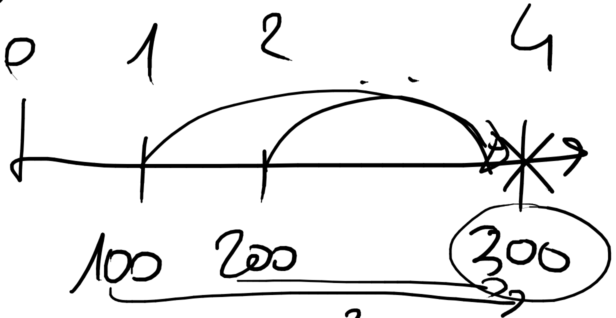
$$\frac{300}{i_{12}}$$

ex = $R = 1000$ ANNUALE $\quad i = 5\%$ Annuale

$$V.A. = \frac{1000}{0{,}05} \text{ (POST)}$$

$$V.A. = \frac{1000}{0{,}05}(1+0{,}05) \text{ (ANT)}$$

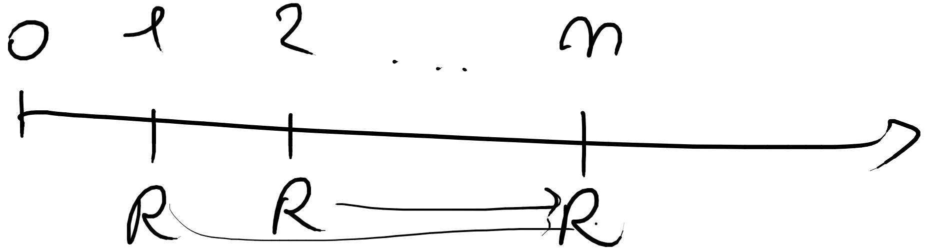
MONTANTE



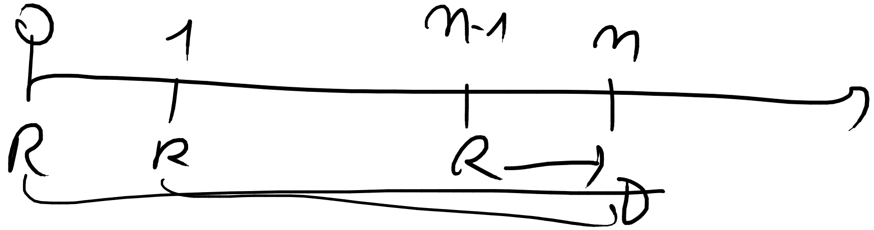
$$M = 300 + 200(1+i)^2 + 100(1+i)^3$$

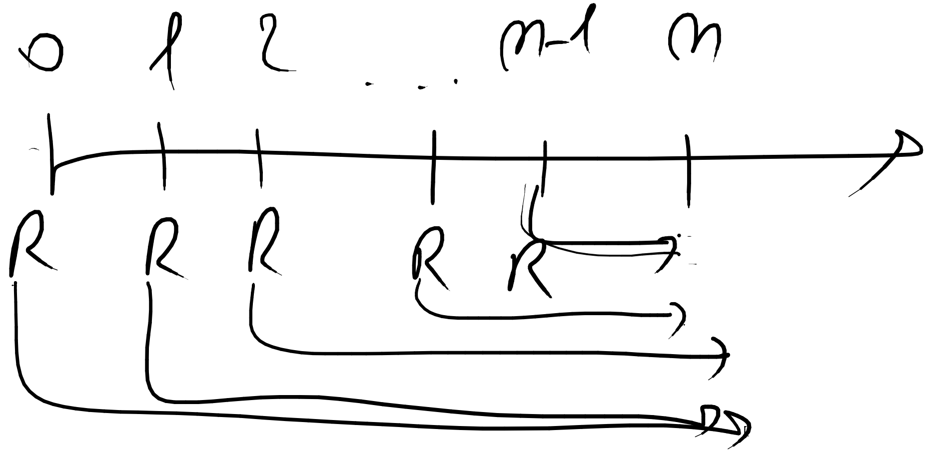
RATA COSTANTE EQUIINTERVALLATA:

(POST)



(ANT)





$$M = R(1+i) + R(1+i)^2 + R(1+i)^n$$

$$M = R(1+i)\left[1 + (1+i) + \dots + (1+i)^{n-1}\right]$$

$$M = R(1+i)\left[\frac{(1+i)^n - 1}{\cancel{1}+i-\cancel{1}}\right]$$

ragione $(1+i) > 1$

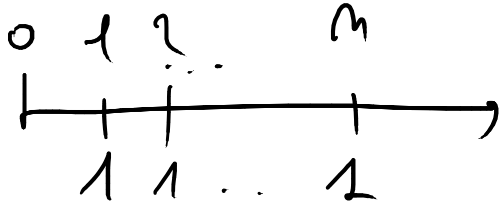
$$\frac{(1+i)^n - 1}{(1+i) - 1}$$

$$M = R(1+i)\left[\frac{(1+i)^n - 1}{i}\right]$$

$$\frac{(1+i)^n - 1}{i} = s_{\overline{n}|i}$$ = montante rendita

Rata UNITARIA

POSTICIPATA



$$M = R \cdot s_{\overline{n}|i} = (\text{POST})$$

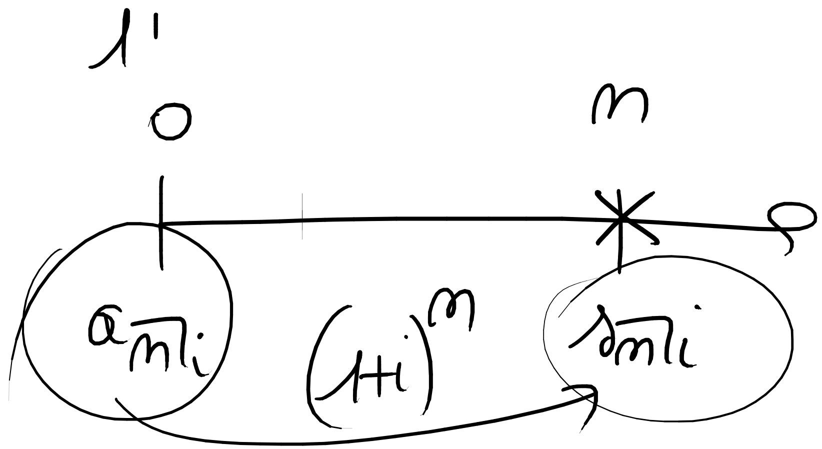
$$M = R \cdot \underbrace{s_{\overline{n}|i}(1+i)} = (\text{ANT})$$

$$M = R\, \ddot{s}_{\overline{n}|i} = (\text{ANT})$$

	POST	ANT
MONTANTE	$R \cdot s_{\overline{n}\rvert i}$	$R \cdot s_{\overline{n}\rvert i}(1+i)$
V.A.	$R \cdot a_{\overline{n}\rvert i}$	$R\, a_{\overline{n}\rvert i}(1+i)$
V.A. perpetua	$\frac{R}{i}$	$\frac{R}{i}(1+i)$

$$s_{\overline{n}\rvert i} = \frac{(1+i)^n - 1}{i}$$

$$\frac{1-(1+i)^{-n}}{i} = a_{\overline{n}\rvert i}$$



$$\underbrace{\frac{1-(1+i)^{-n}}{i}}_{a_{\overline{n}|i}}\,(1+i)^{n} = \underbrace{\frac{(1+i)^{n}-1}{i}}_{s_{\overline{n}|i}}$$

$$\alpha_{\overline{m}i} = \frac{1}{a_{\overline{m}i}}$$

$$\sigma_{\overline{m}i} = \frac{1}{s_{\overline{m}i}}$$