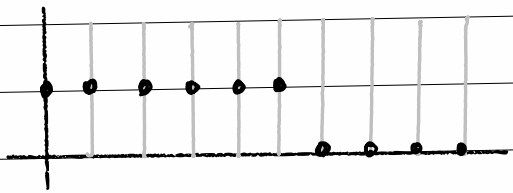
④ $F(z) = \dfrac{z-0,3}{z(z-0,1)(z-0,2)}$

$= \dfrac{z-0,3}{z^3-0,3z^2+0,2z}$

$= \dfrac{z^{-2}(1-0,3z^{-1})}{1-0,3z^{-1}+0,2z^{-2}} = \dfrac{S(z)}{E(z)}$

$s_k - 0,3s_{k-1} + 0,2s_{k-2} = e_{k-2} - 0,3e_{k-3}$

$s_k = 0,3s_{k-1} - 0,2s_{k-2} + e_{k-2} - 0,3e_{k-3}$



$= u_k - u_{k-6}$

$E(z) = \dfrac{1-z^{-6}}{1-z^{-1}} \rightarrow S(z) = F(z)E(z)$

⟶ retrouver $s_k = ?$

⑤ $G(z) = (1-z^{-1})\,Z\left\{\dfrac{F(p)}{p}\right\}$ $\qquad F(p) = \dfrac{p-1}{(p+1)^2}$

$= \left(1-z^{-1}\right).\left(\sum_{0,-1} \text{Res}\left\{\dfrac{p-1}{p.(p+1)^2(1-e^{Tp}z^{-1})}\right\}\right)$

↖ double

$$\operatorname*{Res}_{p=0}\left\{\frac{p-1}{p(p+1)^2}\frac{1}{1-e^{Tp}z^{-1}}\right\} = -1\cdot\frac{1}{1-z^{-1}}$$

$$\operatorname*{Res}_{p=-1}\left\{\frac{p-1}{p(p+1)^2}\frac{1}{1-e^{Tp}z^{-1}}\right\} = \left\{\frac{d}{dp}\left(\frac{p-1}{p(1-e^{Tp}z^{-1})}\right)\right\}_{p=-1}$$

$$= \left\{\frac{p(1-e^{Tp}z^{-1}) - (p-1)(1-e^{Tp}z^{-1} - pTe^{Tp}z^{-1})}{p^2(1-e^{Tp}z^{-1})^2}\right\}_{p=-1}$$

$$= \frac{1-e^{-T}z^{-1} + 2(1-e^{-T}z^{-1}+Te^{-T}z^{-1})}{1(1-e^{-T}z^{-1})^2}$$

$$= \frac{3+(T-3)e^{-T}z^{-1}}{(1-e^{-T}z^{-1})^2}$$

d'où

$$G(z) = (1-z^{-1})\left(\frac{-1}{1-z^{-1}} + \frac{3+(T-3)e^{-T}z^{-1}}{(1-e^{-T}z^{-1})^2}\right) \qquad \alpha = e^{-T}$$

$$= -1 + \frac{3-3z^{-1}+(T-3)\alpha z^{-1} - (T-3)\alpha z^{-2}}{(1-\alpha z^{-1})^2}$$

on peut encore développer si on le souhaite.