$y = f + h * f$

Thm 4.2 $\quad f \in L^1_{loc}(\mathbb{R}^+)$

$$(h * f)(t) = \sum_{n=0}^{\infty} \sum_{r=0}^{\infty} \beta_r^n L^r (\gamma_n * f)$$

β_r^n . $\quad \beta_r^1 = a_r \quad r = 0, 1, 2, \ldots$

$$\beta_r^{n+1} = \sum_{l=0}^{n+1} a_l \beta_{r-l}^n$$

Take $a_j = g_j$ as in $g(t) = \begin{cases} a_j & j \le t < j+1 \\ 0 & t < 0 \end{cases}$

$$= \sum_{r=0}^{n} (-1)^r \binom{n}{r} \frac{1}{(n-1)!} (t-r)_+^{n-1}$$

$$\gamma_n(t) = \text{rect} * \text{rect} * \cdots * \text{rect}(t) \qquad (2.15)$$

$$= \frac{\Delta^n}{(n-1)!} t_+^{n-1} \qquad (2.20)$$

To find $h = \phi(t) + \int_0^t h(s)\phi(t-s)\,ds \quad t \ge 0$

$$h = \phi(t) + (\phi * \phi)(t) + (\phi * \phi * \phi)(t) + \cdots$$

$$= \sum_{n=1}^{\infty} \phi^{\otimes n}(t)$$

Note h is $\qquad (2.26)$

$$\parallel \sum_{n=0}^{\infty} \sum_{r=0}^{n-1} \beta_r^n (L^r \gamma_n)(t)$$

use $\|h - h_\delta\|_\infty \le \dfrac{x\theta(1+\theta)\delta}{1-k} \quad (6.2)$

to select δ s.t. (6.2) $= \epsilon$

also $\quad h_\delta(t) = \frac{1}{\delta} h\left(\frac{t}{\delta}\right) \qquad (3.8)$

To find y. one needs to compute $\gamma_n * f$ for each n