

$$\int'(\lambda) = \int(\infty) - \int(\lambda)$$


In Laplace Tr. (p. 441)

$$V(t) = G(t) + \int_0^t V(t-x) F\{dx\}$$

$$P(\lambda) = \int_0^\infty e^{-\lambda x} K(x) dx = \int_0^\infty e^{-\lambda x} R'(x) dx + \frac{1}{\lambda} R(0)$$

$$v(t) = g(t) + \int_0^t v(t-x) F\{dx\}$$

$$\lambda \psi(\lambda) - R(0) = \frac{r(\lambda)}{1 - q(\lambda)} = \frac{r(\lambda)}{1 - q(\lambda)}$$

a)  $F$  moner,  $q(0) = 1$ ,  $q(\lambda) < 1$  

Whitcomb-Pollaczek

$$R(\lambda) \rightarrow 1 \Rightarrow \omega = \frac{1}{1 - q} = \sum_0^\infty q^n$$

$$P(\lambda) \rightarrow 1 \Rightarrow \psi = \omega \delta$$

$$R(0) v(t) = \int_0^t G(t-x) U\{dx\}$$

$$\alpha \mu < c$$

Asympt.:  $G(\infty) < \infty$ ,  $F$  has exp.  $\mu$

$$V(t) \sim \mu^{-1} G(\infty) t \quad t \rightarrow \infty$$

$$V(t+h) - V(t) \rightarrow \mu^{-1} G(\infty) h$$

b)  $F(\infty) < 1$ ,  $G(\infty) < \infty$

$$q(0) = F(\infty) < 1 \quad \omega(0) < \infty$$

$V$  is bounded

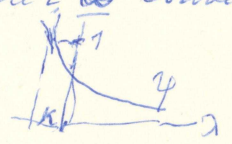
c)  $F(\infty) > 1$   $\cdot$  assume  $q(\lambda) \rightarrow 0$  as  $\lambda \rightarrow \infty$  (no atom at origin)

$$q(k) = 1 \quad \text{with } k > 0$$

argument under a) applies for  $\lambda > k$  (Laplace  $\int_0^\infty e^{-\lambda x} V(x) dx$  converges only for  $\lambda > k$ )

$$v = e^{kx} V^\#$$

$$\psi^\#(\lambda) = \psi(\lambda + k)$$



$$e^{-kx} F = F^\#$$

$$e^{-kx} G = G^\#$$