3.2 $\mu Q = 0 \iff \mu$ stationäre Verteilung

- $P'(t) = P(t)Q = QP(t)$
- $\implies P(t) = E + Q\int_0^t P(s)ds = E + \int_0^t P(s)dsQ$
- $\implies \mu = \mu P(t) = \mu + \int_0^t \mu P(s)dsQ = \mu + t \cdot (\mu Q) = \mu$

3.3 Solidaritätsprinzip

i rekurrent, $j \in K(i)$, also $\exists m, n \in \mathbb{N} : p_{ij}^{(}m)p_{ji}^{(n)} > 0$. Dann

$$\sum_{k=0}^{\infty} p_{jj}^{(k)} \geq \sum_{k=0}^{\infty} p_{jj}^{(n+m+k)} \geq \sum_{k=0}^{\infty} p_{ji}^{(n)} p_{ii}^{(k)} p_{ij}^{(m)} = p_{ij}^{(m)} p_{ji}^{(n)} \sum_{k=0}^{\infty} p_{ii}^{(k)} = \infty$$

4 Verteilungen

- $\mathcal{N}(0, \sigma^2)$: $f(x) = \frac{1}{\sigma\sqrt{2\pi}} \exp(-\frac{1}{2}(\frac{x}{\sigma})^2)$
- $\mathrm{Exp}(\lambda)$: $f(x) = \lambda e^{-\lambda x}$, $F(x) = 1 - e^{-\lambda x}$, $EX = \frac{1}{\lambda}$, $\mathrm{Var}\, X = \frac{1}{\lambda^2}$.
- $\mathcal{P}o(\lambda)$: $P(X = k) = \frac{\lambda^k}{k!} e^{-\lambda}$, $EX = \mathrm{Var}\, X = \lambda$.