

Transformationsregeln zur Laplace - Transformation

$$\textcircled{1} \quad u(t) = \delta(t) := \begin{cases} \rightarrow \infty & t=0 \\ 0 & \text{sonst} \end{cases}$$

$$\downarrow$$
$$\mathcal{L}(u)(s) = 1$$

$$\textcircled{2} \quad u(t) = g(t) \cdot \frac{t^{n-1}}{(n-1)!} e^{at}$$

$$\downarrow$$
$$\mathcal{L}(u)(s) = \frac{1}{(s-a)^n} \quad n \in \mathbb{N}$$

KONKRET

$$n=1 \Rightarrow g(t) \cdot \frac{t^0}{0!} \cdot e^{at} = g(t) e^{at}$$

$$n=2 \Rightarrow g(t) \cdot \frac{t}{1!} e^{at} = g(t) \cdot t e^{at}$$

$$n=3 \Rightarrow g(t) \cdot \frac{t^2}{2!} e^{at} = g(t) \cdot \frac{t^2}{2} e^{at}$$