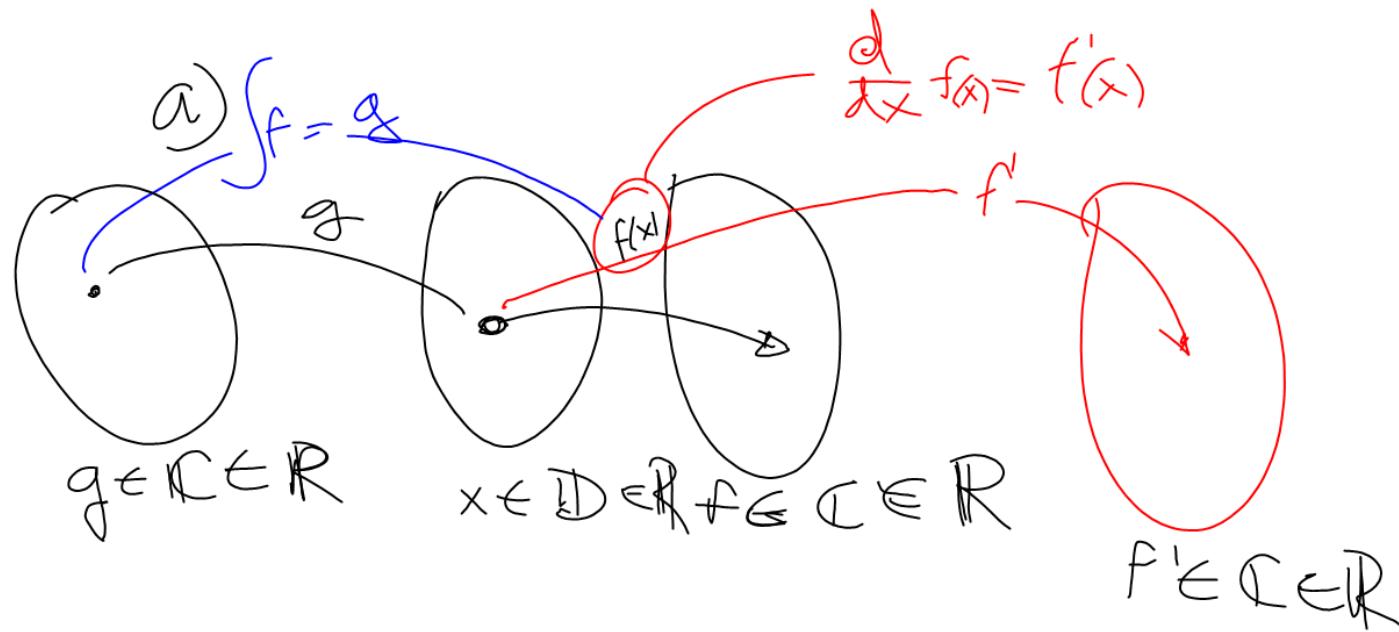
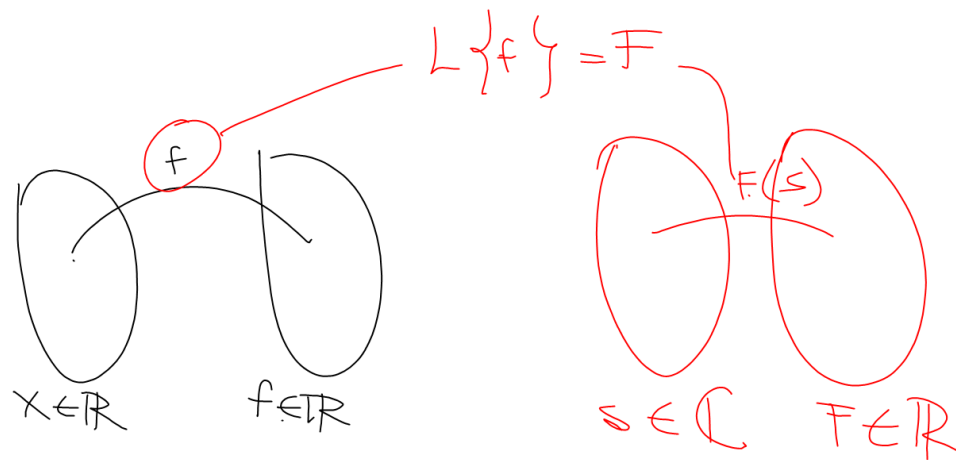


## TEMA 3.-

a) TRANSFORMADA DE LAPLACE.

b) SISTEMAS DE EDOL  
MATRIZ EXPONENCIAL

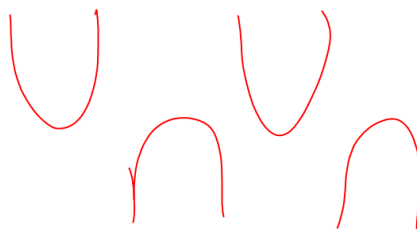




$af + bg \quad a, b \in \mathbb{C} \quad af + bG$

$\begin{matrix} f' & \xrightarrow{\quad} & sF \\ f'' & \xrightarrow{\quad} & s^2 F \\ \int f & \xrightarrow{\quad} & \frac{F}{s} \end{matrix}$

$u(t-1) - u(t-2)$

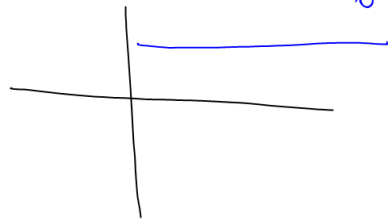


$u(t-a)(t-a) \quad u(t-a) \quad \left\{ \begin{array}{ll} 0 & t < a \\ 1 & t \geq a \end{array} \right.$

$f(t-a) \quad \left\{ \begin{array}{l} 0; t \neq a \\ \int_{-\infty}^{\infty} f(x-a) dx = 1 \end{array} \right.$

$$\mathcal{L}\{f(t)\} = \int_{-\infty}^{\infty} N(t, s) f(t) dt$$

$$\mathcal{L}\{1\} = \int_0^{\infty} e^{-st} \cdot (1) dt \quad N(t, s) = \begin{cases} 0 & ; t < 1 \\ e^{-st} & ; t \geq 1 \end{cases}$$



$$\left[ \frac{1}{s} e^{-st} \right]_0^{\infty}$$

$$\left[ \frac{e^{-st}}{-s} \right]_0^{\infty}$$

$$-\frac{1}{s} \left[ e^{-st} \right]_0^{\infty}$$

$$-\frac{1}{s} \left( \lim_{t \rightarrow \infty} \frac{1}{e^{st}} - 1 \right)$$

$$-\frac{1}{s} \left( \lim_{b \rightarrow \infty} \frac{1}{b} - 1 \right)$$

$$\boxed{\mathcal{L}\{1\} = \frac{1}{s}}$$

$$\mathcal{L}\{t\} = \int_0^{\infty} t e^{-st} dt$$

$$\mathcal{L}\{t\} = \frac{1}{s^2}$$