

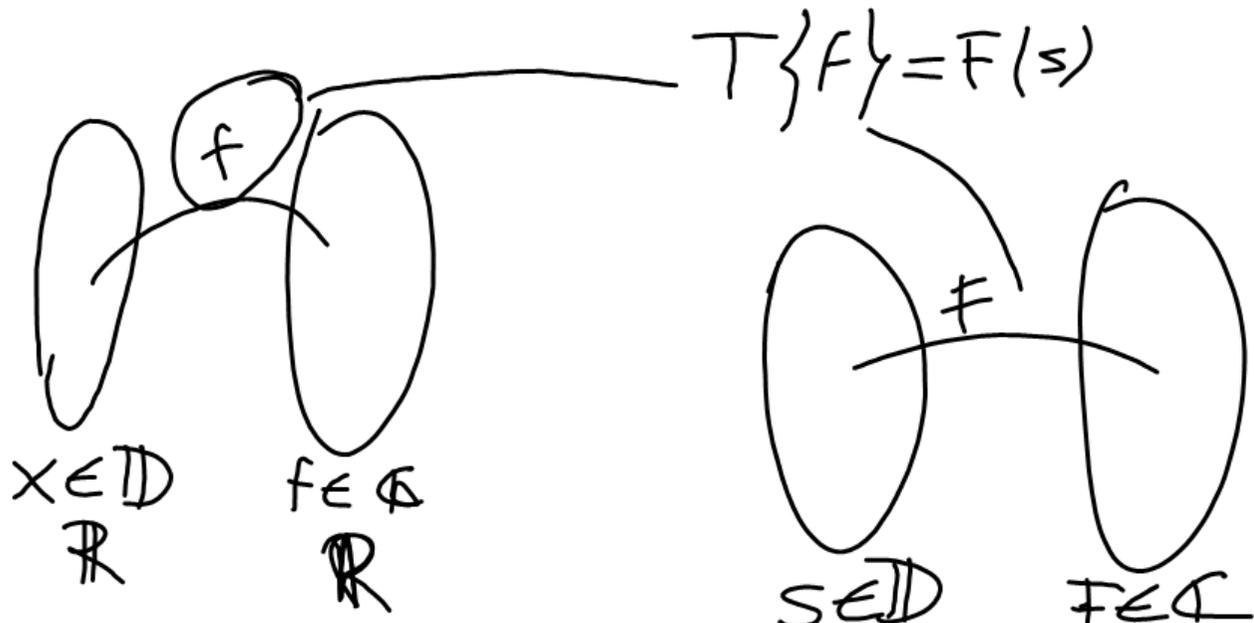
# TEMA 3.-

- a) MÉTODO DE TRANSFORMADA DE LAPLACE
- b) SISTEMAS DE EDOL Y MATRIZ EXPONENCIAL.

$f(x)$   
 $f'(x)$

$x \in D$        $f \in C$        $f' \in C_2$

$C_3$	$D$	$C_1$	$C_2$
$x^3$	$x$	$f = x^2$	$f' = 2x$
0	0	0	0
1	1	1	2
2	2	4	4
3	3	9	6
...	...	...	...

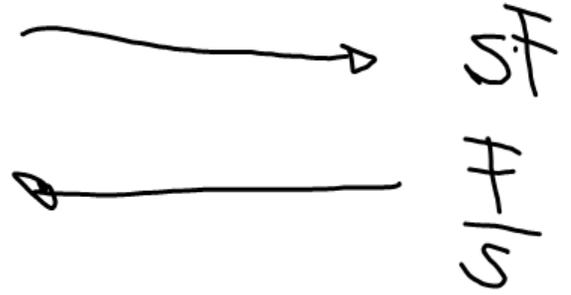


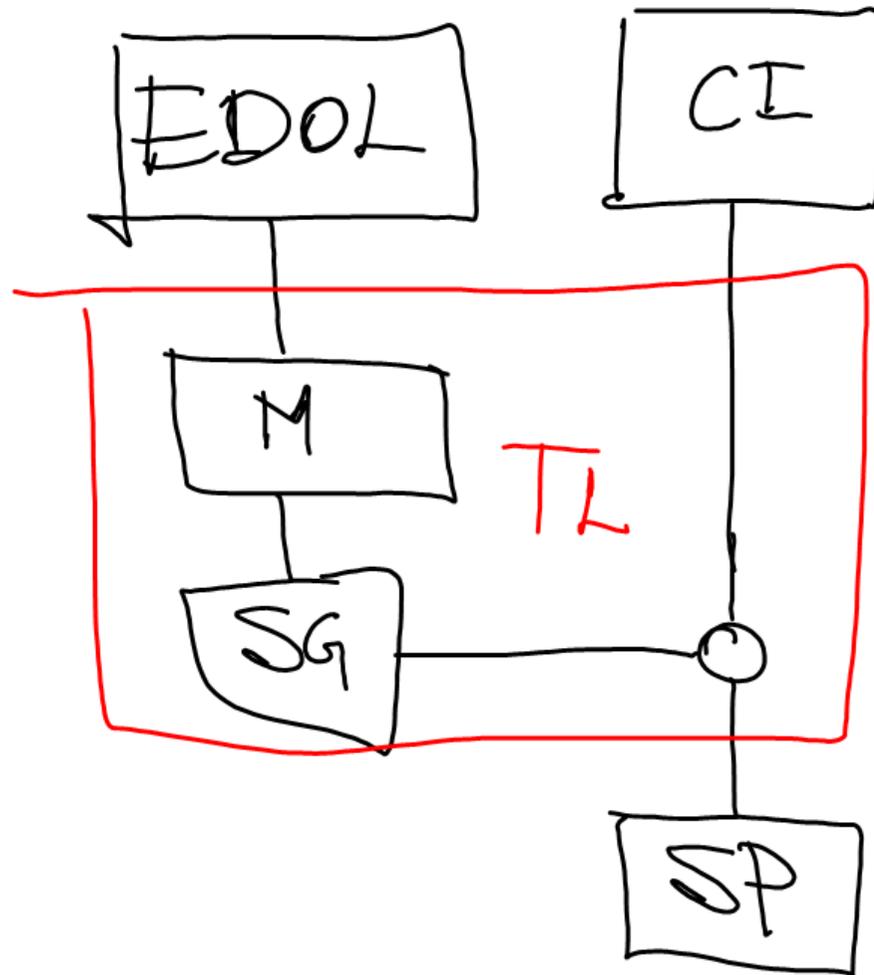
$a, b \in \mathbb{C}$

$af + bg$

$\int_{\mathbb{F}}$

$aF + bG$





$$T \{ f(x) \} = \int_{-\infty}^{\infty} N(x, s) f(x) dx = F(s)$$

↖ operador
↖ argumento

$$N(x, s) = \begin{cases} 0 & ; x < 0 \\ e^{-sx} & ; x \geq 0 \end{cases}$$

núcleo

Laplace.

$$\begin{aligned}
 \mathcal{L}\{1\} &= \int_0^{\infty} e^{-st} \cdot (1) \cdot dt \\
 &= \left[ \int e^{-st} dt \right]_0^{\infty} \\
 &= \left[ \frac{-1}{s} s e^{-st} \right]_0^{\infty} \\
 &= \left[ -\frac{1}{s} (e^{-st}) \right]_0^{\infty} \\
 &= -\frac{1}{s} \left( \lim_{t \rightarrow \infty} e^{-st} - 1 \right) \\
 \mathcal{L}\{1\} &= \frac{1}{s}
 \end{aligned}$$

A red horizontal line is drawn above the first two lines of the derivation. A red arrow points from the limit expression  $\lim_{t \rightarrow \infty} e^{-st}$  to the value  $=0$  written above it.