

PRESENTATION DE



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Laplace Transform :

- Why called Laplace Transform ?
- Why Study Laplace Transform ?
- Defination Laplace Transform ?

Why called Laplace transform



Laplace : Mathematician Name

Transform: one variable change into another variable (s variable change into t and t change into s)

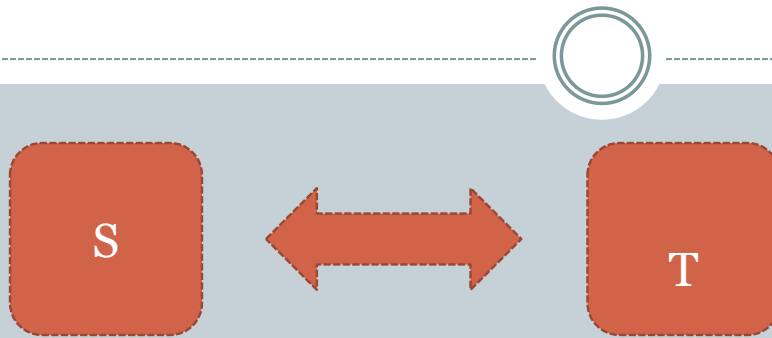
Why Study Laplace Transform

- Solve initial value problem
- Solve Linear Differential Equation (solve in minimum steps)

Defination:

The Laplace Transform is a linear operator that switched a function $f(t)$ to $f(s)$.

Laplace Transform



$$f(s) = \int_0^{\infty} e^{-st} f(t) dt$$

integral 0 to infinity

- But this equation not converge for every function
- EXAMPLE

$$F(t)=1$$

$$f(s) = \int_0^{\infty} e^{-st} \cdot f(t) dt$$

$$f(s) = \int_0^{\infty} e^{-st} \cdot (1) dt$$

$$F(s) = \left| \int_0^{\infty} e^{-st} / -s \right|$$

Laplace Transform



$$-1/s [0-1]$$

$$1/s \quad \text{Answer}$$

LT formulas :

Basic formulas of LT :

1. $L(e^{at}) = 1/s - a$
2. $L(\cos at) = s/s^2 + a^2$
3. $L(\cos ht) = s/s^2 + -a^2$
4. $L(t^n) = \text{under root } n+1/s^{n+1}$

Properties of Laplace Transform :



**WE DISCUSS TWO PROPERTIES OF
LAPLACE TRANSFORM**

1) LINEAR PROPERTY

2) FIRST SHIFTING PROPERTY

Inverse Laplace Transform



$L\{f(t)\} \longrightarrow f(s)$ (Laplace Transform)

$F(t) \longleftarrow L^{-1}\{f(s)\}$ (Inverse Transform)

Same properties as Laplace Transform

Some formulas and examples we discuss....

Differential Equation:

“ An equation containing the derivatives of one or more dependent variables, with respect to one or more independent variables , is said to be a differential equation.”

Differential Equation



EXAMPLE:

$$DY/DT + 10 Y = E^X$$

**THERE ARE TWO TYPES OF DIFFERENTIAL
EQUATION:**

1) ODE

2) PDE

Ordinary Differential Equation



EQUATION CONTAIN:
INDEPENDENT VARIABLE (SINGLE)
DEPENDENT VARIABLE (ONE OR MORE)

Partial Differential Equation



Equation contain:

Dependent variable (one)

Independent variable (one or more)