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Use Laplace transform to solve DEs (Ch 7)

Laplace transform belongs to one type of ":

, Let's first have some basic understanding about

About "integral transform":

- ① Integral transform is one technique to convert a function to another function by

For example:

- ② Depending on the kernel function used, there are many types of integral transforms:

- ③ The meaning of such integration is a measure of

Take Laplace transform for example

$$y(t) \longrightarrow Y(s)$$

This $Y(s)$ measures

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The larger value of the integral, the more $y(t)$ is "like"
 . As an extreme case, if $y(t) = e^{st}$, the integrand
 is , and the integral is

ex: Take a simple example of $y(t) = 1$. Let's compare
 $y(t) = 1$ to e^{st} at different s .

④ The reasons to use these integral transforms:

— DEs are much easier to solve after

ex:

— Laplace transform has many nice properties (because
) This makes Laplace
 transform very successful in solving DEs.

