

LECTURE 5

LAPLACE TRANSFORM (*end*)

Differentiation and integration of the Laplace transform

- Differentiation of the LT
- Integration of LT
- Examples

$$\mathcal{L}^{-1}\left(\frac{s}{(\omega^2 + s^2)^2}\right) = \frac{t}{2\omega} \sin \omega t$$
$$\mathcal{L}^{-1} \log\left(1 + \frac{\omega^2}{s^2}\right) = \frac{2}{t}(1 - \cos \omega t)$$

Existence of the Laplace transform

FOURIER SERIES

Periodic functions

- Definition
- Examples
- Properties:
 - linearity
 - integral over period
 - Periodic prolongation
- Fourier series
 - idea of Fourier series
 - General form
 - Formulas for the coefficients
 - Proving formulas for the coefficients, orthogonality relations

- Even and odd functions and the corresponding Fourier series
- Examples
 - * something simple
 - * Jump function with picture