Outline of 6.1.6.2

Laplace transform

\[ L\{f(t)\} = F(s) = \int_0^\infty e^{-st}f(t)\,dt. \]

1) \[ L\{e^{at}\} = \frac{1}{s-a}, \quad s > a \]

2) \[ L\{\sin at\} = \frac{a}{s^2+a^2}, \quad s > 0 \]

3) \[ L\{c_1f_1(t)+c_2f_2(t)\} = c_1L\{f_1(t)\} + c_2L\{f_2(t)\} \]

4) \[ L\{f'(t)\} = sL\{f(t)\} - f(0) \]

5) \[ L\{f''(t)\} = s^2L\{f(t)\} - sf(0) - f'(0) \]

Solve an IVP problem by Laplace transform and inverse Laplace transform.

Example:

\[ y'' - y' - 2y = 0 \]

\[ \begin{cases} y(0) = 1, & y'(0) = 0 \end{cases} \]