

## Homework 6

Use the Laplace transform to solve the following initial value problems

$$y'' + 3y' + 2y = 0, \quad y(0) = 1, y'(0) = 0,$$

$$y'' - 2y' + 4y = 0, \quad y(0) = 2, y'(0) = 0,$$

$$y^{(4)} - 4y''' + 6y'' - 4y' + y = 0, \quad y(0) = 0, y'(0) = 1, y''(0) = 0, y'''(0) = 1,$$

$$y''' - y'' + y' - y = 0, \quad y(0) = 1, y'(0) = -1, y''(0) = 0,$$

$$y'' - 2y' + y = e^t, \quad y(0) = 2, y'(0) = -1,$$

$$y'' + 4y = \begin{cases} t, & 0 \leq t < 1, \\ 1, & 1 \leq t; \end{cases} \quad y(0) = 0, y'(0) = 0,$$

$$y'' + y' + \frac{5}{4}y = \begin{cases} \sin t, & 0 \leq t < \pi, \\ 0, & \pi \leq t; \end{cases} \quad y(0) = 0, y'(0) = 0.$$