Section 6.2

Homogeneous Linear Equations with Constant Coefficients

Homogeneous Equations with Constant Coefficients

To solve an equation of the form
$$a_n y^{(n)} + a_{n-1} y^{(n-1)} + \cdots + a_1 y' + a_0 y = 0$$
where a_n, ..., a_0 are constants, begin by assuming that a solution of the form $y = e^{rt}$ exists.

This yields an auxiliary equation of the form
$$a_n r^n + a_{n-1} r^{n-1} + \cdots + a_1 r + a_0 = 0$$
which has real distinct, real repeated, and/or complex roots.

Example 1

Find the general solution of
$$y^{(4)} - 4y''' + 10y'' - 12y' + 5y = 0$$