4.3 The Method of Undetermined Coefficients

In this section, we consider the $n$th order linear nonhomogeneous equation with constant coefficients:

$$a_0 y^{(n)} + a_1 y^{(n-1)} + \cdots + a_{n-1} y' + a_n y = g(t).$$

The general solution is

**Example 1.** Find the general solution of

$$y''' - 3y'' + 3y' - y = 4e^t.$$
Example 2. Find a particular solution of

\[ y^{(4)} + 2y'' + y = 3 \sin(t) - 5 \cos(t). \]
Example 3. Find a particular solution of

\[ y''' - 3y'' + 2y' = t + e^t \]