Given that:

With the initial condition:

Solve for , we obtain the result:

Due to the fact that , it leads to:

# 

Given that:

Assume that: is a solution of the given differential equation.

We know that is a solution of , therefore substituting into , we get:

So, is a solution of

To find the general solution of , we rewrite in the following form:

The Wronskian determinant for the equation is:

Hence:

Substitute into the above expression:

Choose

Since, the Wronskian determinant different from 0 for some , therefore and are linearly independent solution of the equation.

Thus, the general solution of the equation is:

Given that:

Where:

Characteristic equation of the given ODE:

So, the complement solution is:

Since the right hand side of the given equation has two terms and , therefore the particular solution also has two term: , respectively.

Solve fore from:

Since, is not a root of characteristic equation.

So, has the following form:

Substituting into the equation we obtain:

Therefore:

Solve fore from:

Since, is a single root of characteristic equation.

So, has the following form:

Substituting into the equation we obtain:

Therefore:

So:

Thus, the general solution of the given differential equation is:

Given that:

Integrating both sides we obtain the final result:

Given that:

With the initial condition: , it leads to:

Hence, the solution of the equation is:

Or: