

Lab 1 Report

Palaskar Adarsh Mahesh

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1 Solution of a Differential Equation Matlab-Simulink

The following differential equation can be solved using Simulink by using integrators and the solution can be observed in the scope:

For the given double differential equation:

$$\frac{d^2y}{dt^2} + 2\frac{dy}{dt} + 5y = 1$$

We need two integrators to arrive at the required solution variable in the scope.

The circuit for solving the above equation is given as:

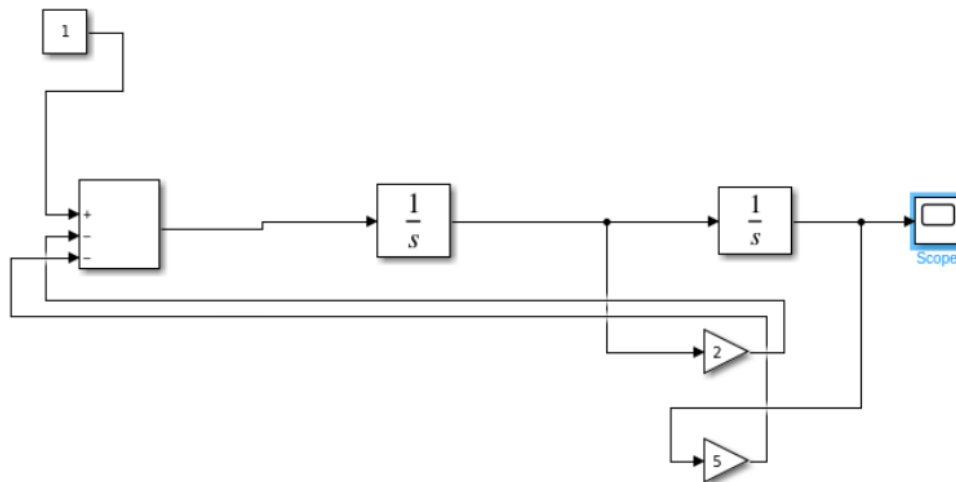


Figure 1: Circuit for solving the given differential equation

The following solution is obtained in the scope:

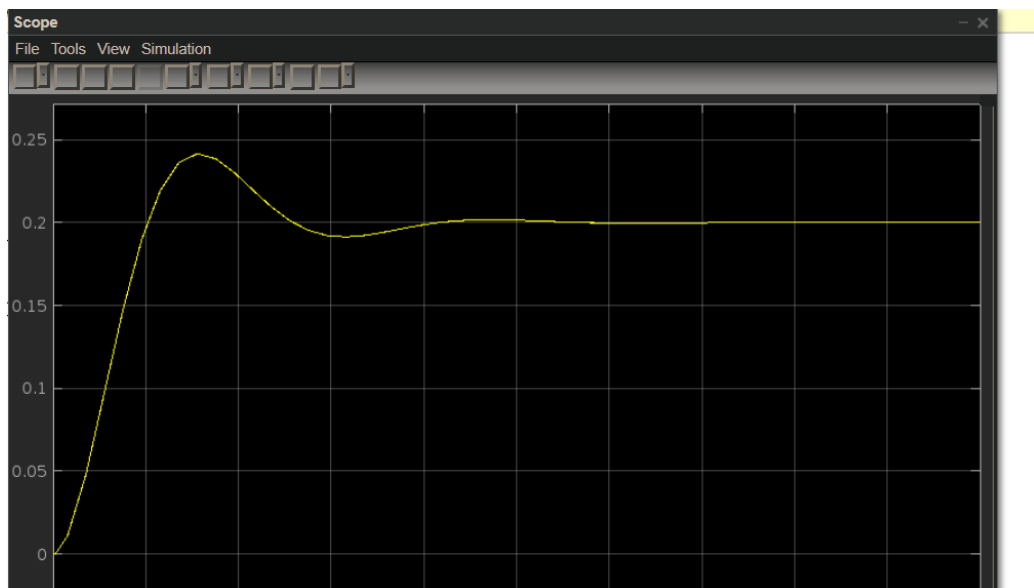


Figure 2: Solution of differential equation

2 Plotting Polynomial Equations on different scales:

$$y = 2x^2 + 7x + 9;$$

The Matlab code for plotting the equation is as follows:

```
x = linspace(0,100, 100);
y = 2*x.^2 + 7*x + 9;

figure(1);

subplot(2,2,1), plot(x,y);
title('Linear-linear');
xlabel('x'), ylabel('y'), grid;

subplot(2,2,2), semilogx(x,y);
title('Logarithmic-linear');
xlabel('x'), ylabel('y'), grid;

subplot(2,2,3), semilogy(x,y);
title('linear-logarithmic');
xlabel('x'), ylabel('y'), grid;

subplot(2,2,4), loglog(x,y);
title('Logarithmic-logarithmic');
xlabel('x'), ylabel('y'), grid;
```

Figure 3: Matlab code

The following graphs are obtained:

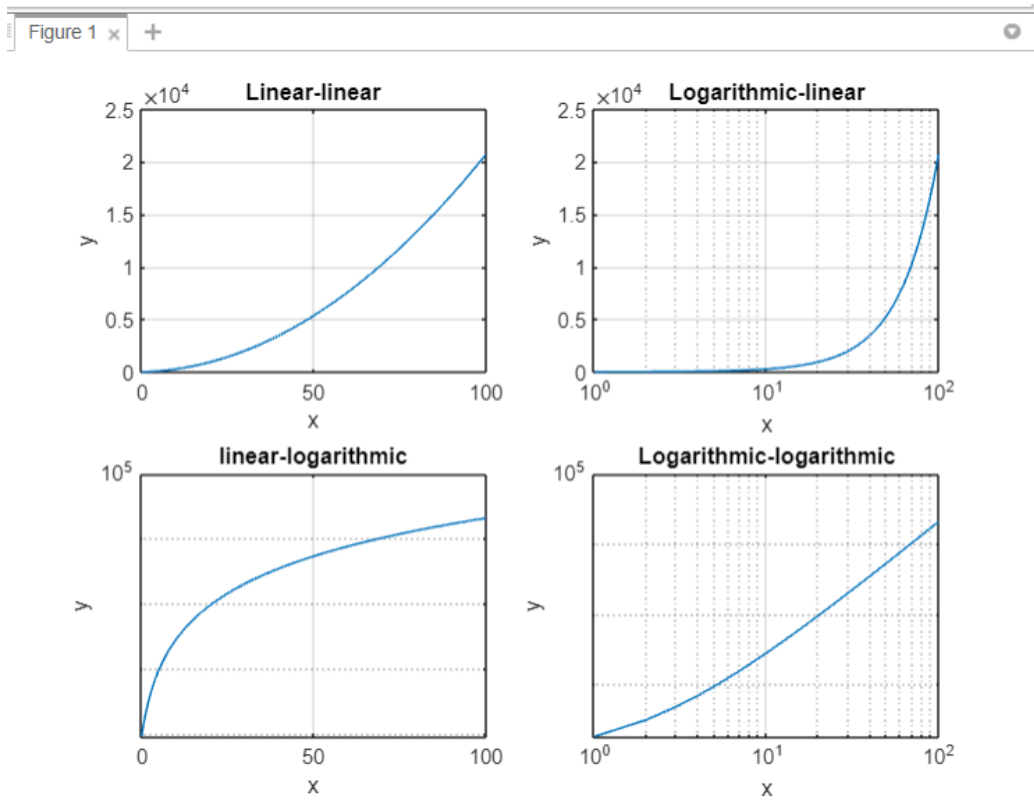


Figure 4: Solution of differential equation