

Homework 2MATLAB

Using MATLAB, Complete the following problems. Show the MATLAB Command and the results obtained.

1) Solve the DE ;

$$y' + 20y = 100 \quad y(0) = 0 \quad t \text{ is variable}$$

2) Solve the DE ;

$$y'' + 7y' + 10y = 2e^{-4t} \quad y(0) = 0, y'(0) = 3 \quad x \text{ is variable}$$

3) Solve the DE ;

$$y'' + 100y = 2 \sin 4t \quad t \text{ is variable}$$

4) Solve (3) with the following initial conditions

$$y(0) = 1, y'(0) = 10$$

5) Solve the following Cauchy-Euler DE ;

$$4x^2 \frac{d^2 y}{dx^2} + 8x \frac{dy}{dx} + y = 0$$

6) Solve the DE ;

$$\frac{dy}{dx} - \frac{xy^2 - \cos x \sin x}{y(1-x^2)} = 0, y(0) = 2$$

7) Evaluate Laplace Transform of $f(t)$

$$f(t) = te^{-6t} + 5$$

8) Evaluate Laplace Transform of $f(t)$

$$f(t) = 10 \cos(4t + \pi/4) - 2t$$

9) Evaluate Inverse Laplace Transform of $F(s)$

$$F(s) = \frac{2s+5}{s^2+6s+34}$$

10) Evaluate Inverse Laplace Transform of $F(s)$

$$F(s) = \frac{(s^2+1)}{s(s+1)(s+2)(s^2+100)}$$