

9.2.1

EE24BTECH11012 - Bhavanisankar G S

QUESTION:

Consider the differential equation $\frac{d^2y}{dx^2} - \frac{dy}{dx} = 0$. Verify that $y = e^x + 1$ is a solution for it.

SOLUTION:

Consider the differential equation,

$$\frac{d^2y}{dx^2} - \frac{dy}{dx} = 0$$

Let $y = Ae^{bx}$ be a solution, then

$$Ab^2e^{bx} - Abe^{bx} = 0 \quad (0.1)$$

$$b^2 - b = 0 \quad (0.2)$$

$$(0.3)$$

$$b = 0 \quad \text{and} \quad b = 1$$

Hence, the solution is $y = A_1e^x + A_2$

If $A_1 = A_2 = 1$, then the solution becomes $y = e^x + 1$

Hence, verified.

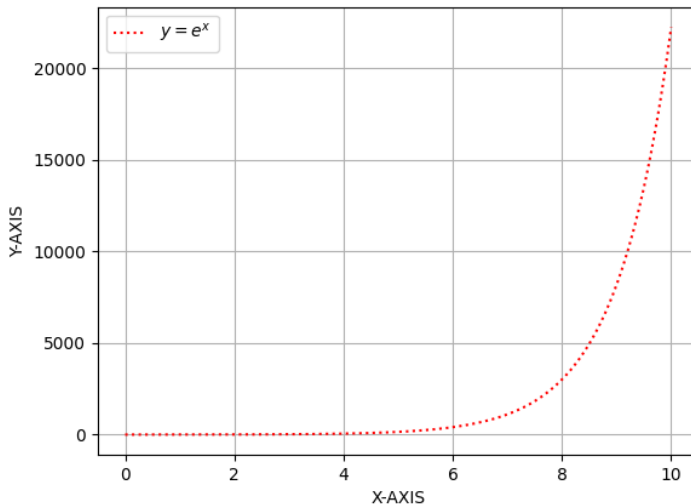


Fig. 0.1: A plot of the given question.