

Use a Laplace transform then an inverse Laplace transform to solve each of the following systems of differential equations.

1.) $\frac{dx_1}{dt} = x_2$, $x_1(0) = 0$

$$\frac{dx_2}{dt} = x_1$$
 , $x_2(0) = 4$

2.) $\frac{dx_1}{dt} = x_2$, $x_1(0) = 1$

$$\frac{dx_2}{dt} = 9x_1$$
 , $x_2(0) = 9$

3.) $\frac{dx_1}{dt} = 2x_1 - x_2$, $x_1(0) = 0$

$$\frac{dx_2}{dt} = 5x_1$$
 , $x_2(0) = 1$

4.) $\frac{dx_1}{dt} = x_1 + x_2$, $x_1(0) = 1$

$$\frac{dx_2}{dt} = x_2 - 4x_1$$
 , $x_2(0) = 2$