TAREA 1: Sistema de ecuaciones diferenciales homogéneos

Trabajo individual.

1. Resolver los siguientes sistemas de ecuaciones diferenciales homogéneos.

i)

$$\begin{aligned} x_1' &= -2x_1 + x_2 \\ x_2' &= x_1 - 2x_2 \\ x_1(0) &= 1,\ x_2(0) = 4 \end{aligned}$$

ii)

$$\begin{aligned} x_1' &= -3x_1 + x_2 \\ x_2' &= x_1 - 3x_2 \\ x_1(0) &= 5,\ x_2(0) = 1 \end{aligned}$$

iii)

$$\begin{aligned} x_1' &= 4x_1 - x_2 \\ x_2' &= 2x_1 + x_2 \\ x_1(0) &= 2,\ x_2(0) = 3 \end{aligned}$$

iv)

$$\begin{aligned} x_1' &= x_1 + x_2 \\ x_2' &= -2x_1 + 4x_2 \\ x_1(0) &= -3,\ x_2(0) = 1 \end{aligned}$$

v)

$$\begin{aligned} x_1' &= x_1 + 2x_2 \\ x_2' &= 2x_1 + x_2 \\ x_1(0) &= -3,\ x_2(0) = 3 \end{aligned}$$

vi)

$$\begin{aligned} x_1' &= 3x_1 + x_2 \\ x_2' &= 5x_1 - x_2 \\ x_1(0) &= -3,\ x_2(0) = 3 \end{aligned}$$

vii)

$$\begin{aligned} x_1' &= -3x_1 + 4x_2 \\ x_2' &= -2x_1 + x_2 \\ x_1(0) &= 3,\ x_2(0) = 3 \end{aligned}$$

viii)

$$\begin{aligned} x_1' &= x_1 + 4x_2 \\ x_2' &= -4x_1 + x_2 \\ x_1(0) &= 1,\ x_2(0) = -1 \end{aligned}$$

ix)

$$\begin{aligned} x_1' &= 2x_1 + 8x_2 \\ x_2' &= -x_1 - 2x_2 \\ x_1(0) &= 2,\ x_2(0) = -1 \end{aligned}$$

x)

$$\begin{aligned} x_1' &= -x_3 \\ x_2' &= 2x_1 \\ x_3' &= -x_1 + 2x_2 + 4x_3 \\ x_1(0) &= 7,\ x_2(0) = 5,\ x_3(0) = 5 \end{aligned}$$