HOMEWORK 10-PART B

1. Find the solution of the initial value problem for the system $y' = Ay$, where $A = \begin{pmatrix} -4 & -5 \\ 2 & 2 \end{pmatrix}$ and $y(0) = (1, 0)^T$.

2. Find the solution of the initial value problem for the system $y' = Ay$, where $A = \begin{pmatrix} -1 & 5 \\ -5 & -1 \end{pmatrix}$ and $y(1) = (5, 5)^T$.

3. Find the equilibrium points for the following systems and draw the points on the phase plane.
(1)

$$\begin{aligned} x' &= x - y - x^2 \\ y' &= x \end{aligned}$$

.
(2)

$$\begin{aligned} x' &= 2x - y \\ y' &= -4x + 2y \end{aligned}$$

.
(3)

$$\begin{aligned} x' &= 1 - e^x(y - e^x) \\ y' &= 2e^x - y \end{aligned}$$

.