HOMEWORK 15-PART A

1 Determine the following functions are linearly independent or not?
(1) $-e^{-t}, e^{-2t}, e^{-3t}$.
(2) $1, t, t^2, t^3, t^4$.
(3) $1, sint, sin2t, sint3t$.

2. (1) Solve the following system $x' = Ax$, where $A = \begin{pmatrix} 0 & 2 & 0 \\ -4 & 4 & 0 \\ -2 & 0 & 1 \end{pmatrix}$.

(2) Determine whether the equilibrium point is stable or unstable, moreover, is it a sink or a source or in other cases?

(3) Could you try to schetch the solution curve? ((3) is optional.)

3. (1) Solve the following system $x' = Ax$, where $A = \begin{pmatrix} 2 & 3 & 0 \\ 0 & 2 & 0 \\ 0 & 3 & 1 \end{pmatrix}$.

(2) Determine whether the equilibrium point is stable or unstable, moreover, is it a sink or a source or in other cases?