

Name:

- (a) Give the general solution to the following system of differential equations.

$$\mathbf{x}'(t) = \begin{pmatrix} -1 & -1 \\ 1 & -1 \end{pmatrix} \mathbf{x}(t)$$

- (b) Solve the initial value problem with the above system of differential equations and the initial value $\mathbf{x}(0) = \begin{pmatrix} 2 \\ -1 \end{pmatrix}$.

- (c) Which of the following describes the origin for the above system of differential equations? Circle one.
- i. source
 - ii. sink
 - iii. saddle point
 - iv. spiral in
 - v. spiral out
 - vi. periodic