

## [mex7] 2D Phase Portrait I

Consider the dynamical system characterized by the following equation of motion:

$$\ddot{x} - \dot{x}^2 + x^2 - x = 0.$$

- (a) Identify all fixed points in the plane  $(x, \dot{x})$  and determine the type of each fixed point.
- (b) Identify the lines of vertical and horizontal isoclines.
- (c) Sketch the phase portrait of this dynamical system including fixed points and isoclines.

**Solution:**