

[mex8] 2D Phase Portrait II

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

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

- (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) Plot the phase portrait of this dynamical system including isoclines. Identify the fixed points in the graph. Use Mathematica StreamPlot or equivalent.

Solution: