


Phase Portraits for Autonomous Systems

Plot an autonomous system of two ODEs, including the direction field, critical point(s), and phase portraits as desired.

Instructions

- To begin, enter the necessary information into the fields below:
 - the bounds for the plot window
 - $F(x, y)$ and $G(x, y)$, the right-hand sides of the autonomous ODEs $\dot{x} = F(x, y)$ and $\dot{y} = G(x, y)$
 - one equilibrium (critical) point as a list $[a, b]$, and multiple such points in a sequence $[a, b], [c, d]$
 - bounds for t , the independent variable of the ODEs, and hence, the parameter along orbits (trajectories or paths)
- Click the **Enter Data** button to obtain a direction field and all entered equilibrium (critical) points.
- Click on the plot area and select the Click and Drag Manipulator () from the Plot menu or plotting toolbar. Then click anywhere in the direction field to create a phase portrait through that point.
- The **Erase Phase Portrait** button erases all orbits and field arrows. The **Clear All** button clears every field in the template.

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Plot Window

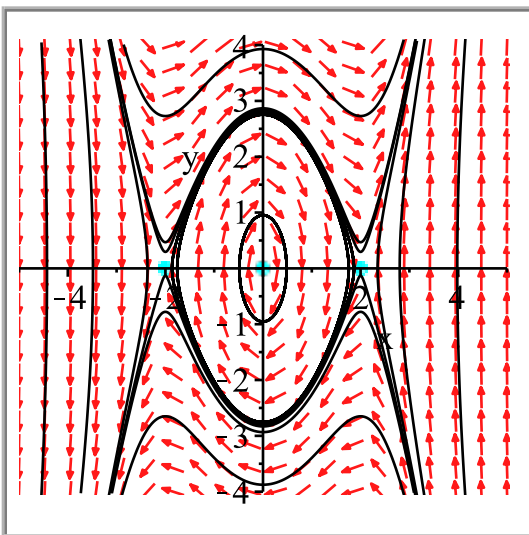
$\leq x \leq$,
 $\leq y \leq$

Differential Equations

$\dot{x} = F(x, y) =$

$\dot{y} = G(x, y) =$

Equilibrium (Critical) Points



[0, 0], [2, 0], [-2, 0]

Parameter

-10

$\leq t \leq$

10

Enter Data