Info

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Fixed points

Definition. Fixed point

For a flow on $\mathbb{R}^n$ $\dot{\mathbf{x}} = \mathbf{f}(\mathbf{x})$, $\mathbf{x}$ is a **fixed point** if $\mathbf{f}(\mathbf{x}) = \mathbf{0}$.

[1]

	sign of real part of eigenvalues		stability
	all 0		
hyperbolic	all > 0	source	unstable
hyperbolic	all < 0	sink	asymptotically stable
hyperbolic	mixed but $\neq 0$	saddle	unstable
	mixed with 0		

for $n = 2$

	sign of real part of eigenvalues		stability	complex parts are all 0, so $\lambda_1, \lambda_2 \in \mathbb{R}$	complex parts are $\neq 0$, so $\lambda \pm \mu$	
	both 0				stable center	
hyperbolic	both > 0	source	unstable		unstable spiral	
hyperbolic	both < 0	sink	asymptotically stable		stable spiral	

	sign of real part of eigenvalues		stability	complex parts are all 0, so $\lambda_1, \lambda_2 \in \mathbb{R}$	complex parts are $\neq 0$, so $\lambda \pm \mu$	
hyperbolic	mixed but $\neq 0$	saddle	unstable		(not possible)	
	mixed with 0				(not possible)	

Current note has 0 direct children and 0 total descendants.

- stamp stamp
  - Rf subobjects of and functions on $\mathbb{R}^n, T^n, S^n, \mathbb{C}^n$
    - Vec ODEs in $\mathbb{R}^n \leftrightarrow$ Vector fields in $\mathbb{R}^n$
      - fixed Fixed points

And it has 10 siblings.

- stamp stamp
  - Rf subobjects of and functions on $\mathbb{R}^n, T^n, S^n, \mathbb{C}^n$
    - Vec ODEs in $\mathbb{R}^n \leftrightarrow$ Vector fields in $\mathbb{R}^n$
      - cons Constant of a flow in $\mathbb{R}^n$
      - Euler method Euler's iterative solution method for first order ODEs
      - existence Existence of integral curves of vector fields in $\mathbb{R}^n$
      - fixed Fixed points
      - flows Flow of a vector field in $\mathbb{R}^n$
      - from graphs Graph $\to$ polynomial ODE
      - grad Gradient flows on $\mathbb{R}^n$
      - Hamiltonian Hamiltonian vector fields in $\mathbb{R}^{2n}$ with standard symplectic form
      - probability distribution Probability distribution of flow
      - volume Volume change by flows on $\mathbb{R}^n$

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1. VBalki.Non-Linear Dynamics.L02 > Critical points of a dynamical system ↩