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dynamical system

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Synonym	supercategorical dynamics
Related topic	SystemDefinitions
Related topic	GroupoidCDynamicalSystem
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Related topic	ChaoticDynamicalSystem
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Defines	planar dynamical system

A *dynamical system* on X where X is an open subset of \mathbb{R}^n is a differentiable map

$$\phi : \mathbb{R} \times X \rightarrow X$$

where

$$\phi(t, \mathbf{x}) = \phi_t(\mathbf{x})$$

satisfies

- i $\phi_0(\mathbf{x}) = \mathbf{x}$ for all $\mathbf{x} \in X$ (*the identity function*)
- ii $\phi_t \circ \phi_s(\mathbf{x}) = \phi_{t+s}(\mathbf{x})$ for all $s, t \in \mathbb{R}$ (*composition*)

[?][?]

Note that a *planar dynamical system* is the same definition as above but with X an open subset of \mathbb{R}^2 .

References

- [HSD] Hirsch W. Morris, Smale, Stephen, Devaney L. Robert: Differential Equations, Dynamical Systems & An Introduction to Chaos (*Second Edition*). Elsevier Academic Press, New York, 2004.
- [PL] Perko, Lawrence: Differential Equations and Dynamical Systems (*Third Edition*). Springer, New York, 2001.