

Dynamical systems

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Block I

Definitions

1. Unidimensional discrete dynamical systems

introduction

Dynamical system

Let:

· M manifold

· T monoid

· $\phi : M \times T \rightarrow M$

Then, (M, T, ϕ) is a dynamical system if:

· $\forall x \in X$:

$$\phi(x, 0) = x$$

$\forall t_1, t_2 \in T$:

$$\phi(\phi(x, t_1), t_2) = \phi(x, t_1 + t_2)$$

Dimension

Let:

· (M, T, ϕ) dynamical system

We name dimension of (M, T, ϕ) to:

· $\dim(M)$

We denote:

· $\dim(M) = n : (M, T, \phi)$ n-D dynamical system

Discrete

Let:

· (M, T, ϕ) dynamical system

Then, (M, T, ϕ) is discrete if:

· $T \stackrel{\subset}{\sim} \mathbb{N}$

Continuous

Let:

· (M, T, ϕ) dynamical system

Then, (M, T, ϕ) is continuous if:

· $T \subset \mathbb{R} \quad \text{,,} \quad T \text{ open}$

Block II

Propositions

1. Unidimensional discrete dynamical systems

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Block III

Examples

1. Unidimensional discrete dynamical systems

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Block IV

Exercises

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Block V

Tasks