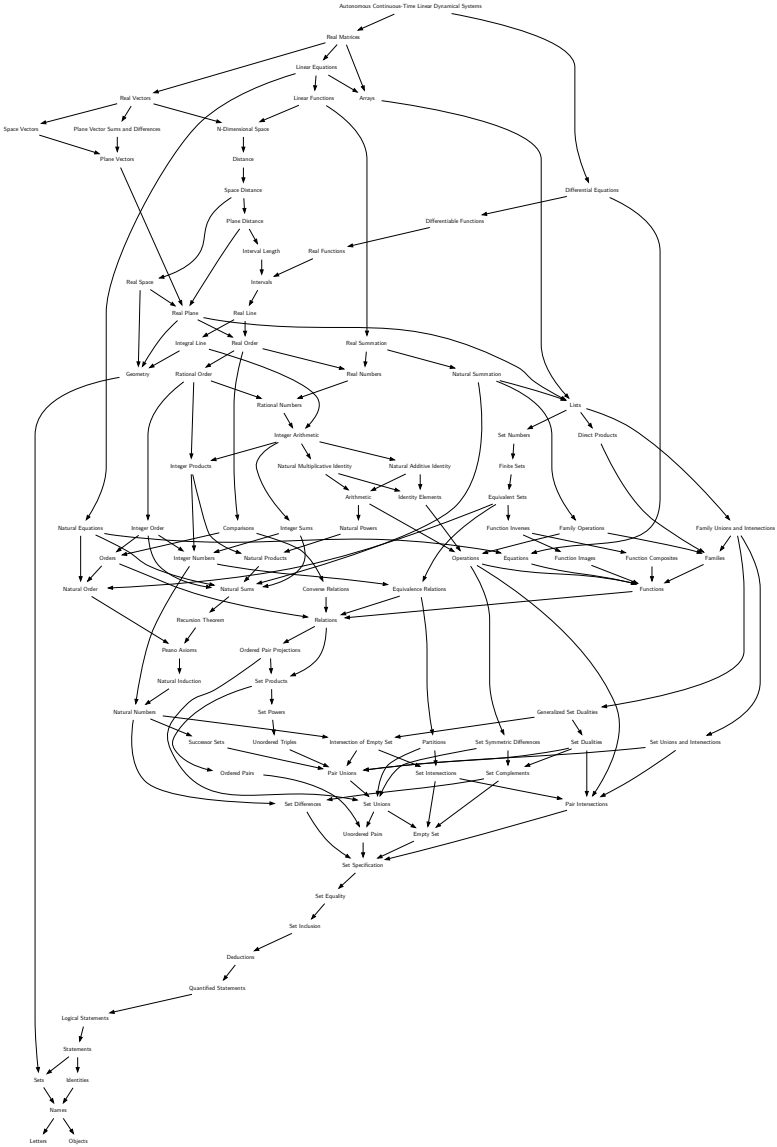
Definition

An *autonomous continuous-time linear dynamical system* is a matrix $A \in \mathbf{R}^{n\times n}$. It models the behavior of a *signal* $x : \mathbf{R} \to \mathbf{R}^n$ by

$$\dot{x} = Ax, \tag{1}$$

where $\dot{x}$ is notation for $\frac{d}{dt}x(t)$. A is called the *dynamics matrix*.

A signal x satisfying Equation (1) is called a *solution* or a *trajectory*. For $t \in \mathbf{R}$, $x(t) \in \mathbf{R}^n$ is called the *state* and $\mathbf{R}^n$ is called the state space. n is called the *state dimension*.


Autonomous Continuous-Time Linear Dynamical Systems
Real Matrices
Linear Equations
Real Vectors
Linear Functions
Arrays
Space Vectors
Plane Vector Sums and Differences
N-Dimensional Space
Plane Vectors
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Direct Products
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Natural Multiplicative Identity
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Integer Order
Comparisons
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Function Inverses
Family Operations
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Integer Numbers
Natural Products
Operations
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Function Images
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Peano Axioms
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Set Products
Generalized Set Dualities
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Successor Sets
Unordered Triples
Intersection of Empty Set
Partitions
Set Symmetric Differences
Set Dualities
Set Unions and Intersections
Ordered Pairs
Pair Unions
Set Intersections
Set Complements
Set Differences
Set Unions
Pair Intersections
Unordered Pairs
Empty Set
Set Specification
Set Equality
Set Inclusion
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Statements
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Names
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Objects