Why

We want to model the progressive fill-in during Gauss elimination with graphs.

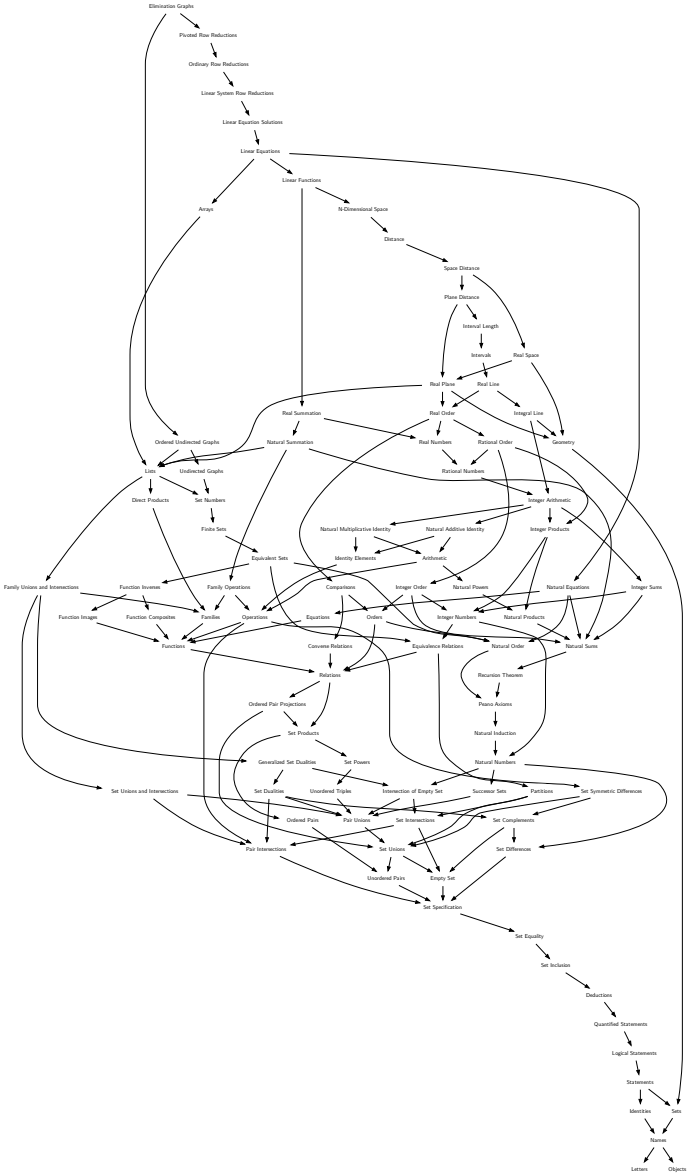
Definition

Let $G = ((V, E), \sigma)$ be an ordered undirected graph with $\nu mV = n$. Define $E_0 = E$. The *elimination edge sequence* of G is a sequence $(E_1, \ldots, E_{n-1})$ defined by

$$E_i = E_{i-1} \cup \{\{v, w\} \mid v \succ \sigma(i), w \succ \sigma(i), \text{ and } \{\sigma(i), w\} \in E_{i-1}\}$$

for $i = 1, \ldots, n-1$. The difference between E_{i-1} and E can be described by saying that the higher neighborhood of the intermediate graph $((V, E_{i-1}), \sigma)$ is made complete by the addition of edges between all nonadjacent vertices.

The *elimination graph* of G is the graph $((V, E_{n-1}), \sigma)$.


Elimination Graphs
Pivoted Row Reductions
Ordinary Row Reductions
Linear System Row Reductions
Linear Equation Solutions
Linear Equations
Linear Functions
Arrays
N-Dimensional Space
Distance
Space Distance
Plane Distance
Interval Length
Intervals
Real Space
Real Plane
Real Line
Real Order
Integral Line
Real Summation
Real Numbers
Rational Order
Geometry
Ordered Undirected Graphs
Natural Summation
Lists
Undirected Graphs
Rational Numbers
Direct Products
Set Numbers
Integer Arithmetic
Finite Sets
Natural Multiplicative Identity
Natural Additive Identity
Integer Products
Identity Elements
Arithmetic
Equivalent Sets
Family Unions and Intersections
Function Inverses
Family Operations
Comparisons
Integer Order
Natural Powers
Natural Equations
Integer Sums
Function Images
Function Composites
Families
Operations
Equations
Orders
Integer Numbers
Natural Products
Functions
Convene Relations
Equivalence Relations
Natural Order
Natural Sums
Relations
Recursion Theorem
Ordered Pair Projections
Peano Axioms
Set Products
Natural Induction
Generalized Set Dualities
Set Powers
Natural Numbers
Set Unions and Intersections
Set Dualities
Unordered Triples
Intersection of Empty Set
Successor Sets
Partitions
Set Symmetric Differences
Ordered Pairs
Pair Unions
Set Intersections
Set Complements
Pair Intersections
Set Unions
Set Differences
Unordered Pairs
Empty Set
Set Specification
Set Equality
Set Inclusion
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Letters
Objects