Why

Often the edges of some graph are associated with a particular cost, perhaps the cost of traversing that edge.

Definition

Undirected form

A *weighted undirected graph* is an ordered pair $((V, E), w)$ where (V, E) is an undirected graph and $w : E \to \mathbf{R}$ is an *unordered weight function*.

Directed form

A *weighted directed graph* is an ordered pair $((V, F), \omega)$ where (V, E) is an digraph and $\omega : F \to \mathbf{R}$ is an *ordered weight function* (or *weight function*).

Weighted Graphs

Real Functions · Undirected Graphs · Directed Graphs

Intervals

Set Numbers

Real Line

Finite Sets

Real Order

Real Numbers · Rational Order

Integral Line · Rational Numbers

Integer Arithmetic · Natural Fractions

Natural Additive Identity · Natural Multiplicative Identity · Integer Products

Identity Elements · Natural Arithmetic · Equivalent Sets

Operations · Natural Powers · Integer Sums · Integer Order · Comparisons · Function Inverses

Natural Products · Integer Numbers · Orders · Function Images · Function Composites

Natural Sums · Equivalence Relations · Natural Order · Converse Relations · Functions

Recursion Theorem · Relations

Peano Axioms · Ordered Pair Projections

Natural Induction · Set Products

Natural Numbers · Set Powers · Ordered Pairs

Set Partitions · Intersection of Empty Set · Successor Sets · Unordered Triples

Set Intersections · Set Symmetric Differences · Pair Unions

Pair Intersections · Set Complements · Set Unions

Empty Set · Set Differences · Unordered Pairs

Geometry · Set Specification

Set Equality

Set Inclusion

Deductions

Quantified Statements

Logical Statements

Statements

Sets · Identities

Names

Letters · Objects