Why

Definition

An undirected graph is a *tree* if it is connected and acyclic. An undirected graph is a *forest* if it is acyclic. Each connected component of a forest is a tree, motivating the definition.

Properties

Proposition 1. *There is a unique path between any two vertices of a tree.*

Proof. Such a path exists because the tree is connected. Such a path is unique because the existence of two separate paths would create a cycle. □

Distance

The *distance* between two vertices v and w in a tree is the length of the unique path connnecting v and w. Recall that the length of a path is the number of edges, or one fewer than the number of vertices. If v and w are adjacent in the tree, then there distance is 1.

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[1]Future editions will include.

Trees

Undirected Paths

Undirected Graphs

Lists

Set Numbers

Direct Products

Finite Sets

Equivalent Sets

Function Inverses

Natural Order

Family Unions and Intersections

Function Images

Function Composites

Families

Equivalence Relations

Functions

Peano Axioms

Relations

Natural Induction

Set Products

Set Powers

Natural Numbers

Generalized Set Dualities

Partitions

Unordered Triples

Intersection of Empty Set

Successor Sets

Set Dualities

Set Unions and Intersections

Ordered Pairs

Set Intersections

Pair Unions

Set Complements

Set Unions

Set Differences

Pair Intersections

Unordered Pairs

Empty Set

Set Specification

Set Inclusion

Standardized Accounts

Accounts

Deductions

Quantified Statements

Logical Statements

Statements

Identities

Sets

Names

Letters

Objects