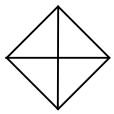

Rooted Trees

1 Why

We want to talk about orienting the edges of a tree away from a given vertex.

2 Definition

A *rooted tree* is an ordered pair whose first object is a tree and whose second object is a vertex of the tree. We call the vertex the *root*.

Using the pair we can construct a directed graph by orienting all the edges away from the root. There are as many choices of rooted trees as there are choices of root: namely, the number of vertices in the tree. Each choice leads to a different graph since all trees are connected. If they were disconnected, some of the graphs may turn out to be the same.

2.1 Notation

We denote the tree T rooted at vertex i by (T, i).

3 Properties

Proposition 1. *Let (T, i) be a rooted tree. In the directed graph corresponding to this rooted tree every vertex has one parent.*

We denote the parent of vertex i by pa_i.