Proof that every tree with n vertices has $n-1$ edges

Since T is a tree, T has at least two leaves.

Let v be a leaf in T, and let w be its single neighbor.

Let T' be the graph created by deleting v.

Note that T' is a tree with K vertices, because:

- T' has one less vertex than T.
- T' is connected and acyclic

By the inductive hypothesis, T' has $K-1$ edges.

Recall that T' has one less edge than T.

Hence T has K edges. (q.e.d.)

Important: We started with a tree on $K+1$ vertices and removed a leaf to get a tree on K vertices. We did not go the reverse direction!