Name _____

CSCI 332, Fall 2025
Quiz 5

Fill in the following to prove that all trees have one more node than they have edges.

Proof

(1 point) Universal declaration: Let T be an arbitrary _____.

(2 points) Inductive hypothesis (for this proof, use "fewer nodes than" for your definition of "smaller than"):

There are two cases:

(2 points) Base case: Suppose T has one node. (you fill in the rest up to wrap-up sentence)

So T has one more node than it has edges.

(5 points) Inductive case: Suppose T has more than one node. (you fill in the rest. Points divided as follows: 1 point each for create a smaller tree T', applying the inductive hypothesis to T', explaining how to get from T' back to T, and 2 points for explaining how the number of nodes and edges change when going from T' to T.)

So T has one more node than it has edges.