To determine whether an undirected graph is a tree, we check two conditions:

**Connectedness:** Ensure that every pair of nodes is connected. we can use DFS or BFS to traverse the graph and confirm that all nodes are visited.

**Acyclic:** Verify that there are no cycles in the graph. During traversal, if we encounter a visited node that is not the parent (for DFS) or predecessor (for BFS), it indicates a cycle.

If both conditions are met, the graph is a tree.

**Running Time:**

Both DFS and BFS have a time complexity of O(V + E), where V is the number of vertices (nodes) and E is the number of edges. For a tree, E is always V - 1, simplifying the time complexity to O(V).