We say that T is planar if it can be drawn in the plane without crossing edges. The natural question is if there is a reasonable way to characterise planar graphs.

Define T_1 and T_2 to be homeomorphic if they can both be obtained from the same graph by sequences of edge subdivisions. Then...

Kuratowski's Theorem: T is planar iff it has no subgraph homeomorphic to either K_5 or $K_{3,3}$ (complete graph on 5 nodes or complete bipartite graph on two sets of 3 nodes).