CS130 - Trees Summary

Trees are undirected graphs with the additional properties of:

- Connectivity, every node has a walk to every other node in the graph
- Acyclic, does not contain cycles

A Spanning tree of a graph is a tree which contains all the same vertices as the graph
↳ "Prune" cycles out.
Every connected graph has a spanning tree.

The five definitions of trees

Consider a simple undirected graph $G = (V, E)$
The following statements are equivalent:

1) G is acyclic and connected
2) G is acyclic and $|E| = |V| - 1$
3) G is connected and $|E| = |V| - 1$
4) G is connected, but removing any edge makes it disconnected
5) G is acyclic, but any edge addition makes it cyclic.