1. For which values of $m$ and $n$ is $K_{m,n}$ a tree?

2. How many vertices does a full 5-ary tree with 100 internal vertices have?

3. How many vertices and how many leaves does a complete $m$-ary tree of height $h$ have?

4. How many vertices must be removed from a connected graph with $n$ vertices and $m$ edges to produce a spanning tree?
5. Show a diagram of a depth-first spanning tree of each of the following graphs.

(a) \( K_5 \)

(b) \( K_{3,4} \), starting at a vertex of degree 3.

(c) \( Q_3 \)
6. Show a diagram of a breadth-first spanning tree of each of the following graphs.

   (a) $K_5$

   (b) $K_{3,4}$, starting at a vertex of degree 3.

   (c) $Q_3$

7. What does a depth-first spanning tree of $K_n$ look like for positive integers $n$?
8. What does a breadth-first spanning tree of $K_n$ look like for positive integers $n$?

9. Show a backtracking tree that finds a subset, if it exists, of set 27, 24, 19, 14, 11, 8 with sum

   (a) 20

   (b) 41
10. Characterize the number of trees in a spanning forest of a graph in terms of the graph’s connectivity.

11. How many edges must be removed from a graph with $n$ vertices, $m$ edges and $c$ connected components to produce a spanning forest?