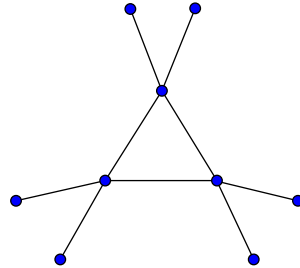
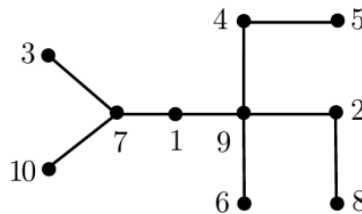


4. ENUMERATION OF SPANNING TREES

1. Give the number of spanning trees of the graph
 - a) P_n , the path with n edges;
 - b) C_n , the cycle on n vertices.
2. How many spanning trees does the following graph have?



3. Among the spanning trees of K_n , how many stars and paths are?
4. Count the number of spanning of K_n in which the fixed vertex u is a leaf. (Here $n \geq 2$.)
5. Determine the Prüfer code of the following labeled tree.



6. a) Find the labeled tree whose Prüfer code is 5, 3, 3, 3, 1, 4.
 b) Find the labeled tree whose Prüfer code is 1, 5, 1, 5, 9, 8, 2.
7. Deduce Cayley's theorem from Kirchhoff's matrix tree theorem.
8. We leave an edge from the complete graph on $n \geq 3$ vertices. How many spanning trees does the obtained graph have?
9. Count the number of spanning of the complete bipartite graph $K_{m,n}$.