(1) Compute the total number of $r$-step closed walks on the complete bipartite graph $K_{m,n}$.

(2) Are trees bipartite? Explain.

(3) A graph $\Gamma$ is said to be a forest if each of its connected components is a tree. Prove that a forest $\Gamma$ with $n$ vertices and $k$ connected components has $n - k$ edges.