1. (5 points) Please give the graph theory definition of a tree.

2. (5 points) Suppose that you have a friend who has taken a graph theory course and who claims to have drawn a tree with 15 vertices and 12 edges. In one sentence, please explain why is your friend mistaken.

3. (10 points) An edge in a connected graph $G$ is a bridge iff its removal will disconnect the graph. Please show that if $G$ is a cycle, then none of its edges is a bridge. Hint: Start with the definition of a cycle.