MA 2312 – Discrete Mathematics
Quiz 5

Do all questions. You have 30 minutes to do this exam. Your grade depends on clear and succinct explanations.

Name: ________________________________ Date: ______________

1. Use the definition of big-oh to prove that $1^2 + 2^2 + ... + n^2$ is $O(n^3)$.

2. Prove that $x^3 + 7x + 2$ is $\Omega(x^3)$.

3. In the questions below mark the statement TRUE or FALSE. Briefly explain your answer.
   - If $T$ is a tree with 17 vertices, then there is a simple path in $T$ of length 17.
   - Every tree is bipartite.
   - Every tree is planar.
   - No tree has a Hamilton path.
   - If $T$ is a tree with 50 vertices, the largest degree that any vertex can have is 49.

4. Prove that if $T$ is a full $m$-ary tree with $l$ leaves, then $T$ has $(ml - 1)/(m - 1)$ vertices.

5. Draw two non-isomorphic spanning trees of the complete bi-partite graph $K_{3,4}$