Summary of Topics for Test 3

Probability
- Tree Diagrams
  - Know how to make a tree for an experiment, labeling the branches with the probabilities and conditional probabilities
  - Know how to use Bayes' Theorem to find conditional probabilities.

Graph Theory
- Terms: vertex, edge, adjacent vertices, isolated vertex, degree of a vertex, path, circuit, connected graph;
- Know how to find the number of vertices, the sum of degrees, and the number of edges in a given graph.
- Equivalence: To show that two graphs are equivalent, find a one-to-one correspondence between the vertex sets that preserves adjacency.
- Planar Graph: To show a graph is planar, you can draw it without crossing edges.
- Degree Sequence of a graph lists the degree of each vertex of the graph in decreasing order. Determine some properties of the graph from this information.
- Eulerian Circuit, Eulerian Path, Hamiltonian Circuit: List the sequence of vertices to indicate the circuit or path; know how to determine whether one exists using Euler's Theorem and the Three Hamiltonian Principles
- Minimum Spanning Tree – Use Kruskal's algorithm and Prim's algorithm to find one.
- Graph coloring – Assign a color to each vertex of the graph so that no two adjacent vertices get assigned the same color. \( \chi(G) \) = the chromatic number of the graph. A bipartite graph has chromatic number 2.
- Trees: Know the properties of trees;
  - Applications using Binary trees: storing words in alphabetical order
  - storing numbers in increasing order
  - evaluating algebraic expressions
- Adjacency matrix for a Graph - know how to write the matrix for a given graph,
  - know how to make a graph for a given matrix.