

Math 3V03 Midterm 1 Info Sheet

The purpose of this handout is to help you study by listing the concepts, definitions, and results you will need to know for the midterm.

Midterm Information. The midterm will be on Thursday Oct. 8, 2015 at 10:30AM. The midterm will take place in

BURKE SCIENCE BUILDING 104

and will be 50 minutes long. You will *not* be allowed to bring in any notes, use the text book, or use a calculator. Please bring your **Student Card**.

Material Covered. All the material discussed in class may appear on the midterm. We covered all the material of Chapters 1-3 except Section 3.3. Below, I have given a breakdown of what you will need to know from each section. Note that when you are learning terms, it is good to think of an example of a graph that satisfies that term, and a graph that does not satisfy that property.

Section 1.1 Know the definition of a graph, edge and vertex. Know the difference between a graph, multigraph, and pseudograph. Know the terms: adjacent, incident, neighbours, degree, isolated vertex, end vertex, and graphic. Know the Handshaking Theorem (Theorem 1.1.1) and how to use Theorem 1.1.2 to determine if a sequence is graphic.

Section 1.2 Terms to know include: subgraph and isomorphic. Also, know how to construct all the graphs introduced in this section, i.e., Petersen, complete graph, complete bipartite graph, path, and cycle.

Section 1.3 Terms to know include: connected, tree, forest, and spanning tree. Know some of the properties of trees (e.g., Theorem 1.3.5), and be able to find a spanning tree in a graph.

Section 2.1 Terms to know include: colouring, proper subgraph, critical, girth, bipartite, distance, and diameter. Be able to colour a graph, know some of the basic properties of colouring, and know how to draw the wheel graph.

Section 2.2 Terms to know include: edge colouring, proper edge colouring, regular graph, edge chromatic number, and 1-factor. Be able to find the edge colouring of a graph. Also, be able to find a 1-factor in a graph (or explain why it cannot be found).

Section 2.3 Terms to know include: decomposed, Hamilton cycle, Hamilton path, snark. Be able to find a Hamilton cycle (or path) in a graph, or be able to argue that one does not exist.

Section 2.4 Terms to know include: bridges, banks, and components. Know how to make the decompositions described in this section.

Section 3.1 Terms to know include: walk, closed walk, trail, path, length, closed trail, circuit, closed path, Eulerian circuit. Know how to determine if a graph has an Eulerian circuit (e.g. Theorems 3.1.1 and 3.1.2). Also, be able to decompose such a graph into 2-factors. Similarly, know when a graph has an Eulerian trail.

Section 3.2 Terms to know include: the Oberwolfach problem. Also know how to make the decompositions described in this section, e.g., Theorem 3.2.3.

If you have questions, please feel free to email me. Good luck!