

Math 3V03 Midterm 2 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 Nov. 12, 2015 at 10:30AM. The midterm will take place in

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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 4-6. Below, I have given a breakdown of what you will need to know from each section. Note that when you are learning definitions, 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 4.1 Know the statement of Turan (4.1.2) and how to use it. Know what a Turan graph is. Know how to do problems similar to the exercises.

Section 4.2 Know what a cage is, and know what the small cages are (e.g. Peterson, Heawood).

Section 4.3 Know what a Ramsey number is, and some of the small values of the Ramsey number, e.g. $r(1, n)$ and $r(2, n)$. Know how to use Theorem 4.3.2 to bound $r(m, n)$.

Section 5.1 Know what a derangement is, and know its formula. Be able to do problems like the ones in this section.

Section 5.2 Know how Prüfer's method works. In particular, be able to go from a labelled tree to a sequence, and vice versa. Know the formula of Theorem 5.2.1.

Section 5.3 Know the formulas from this section, and be able to do problems similar to this section.

Section 6.1 Know what it means for a graph to be magic and anti-magic. Be able to find magic and anti-magic labellings. You do not need to know about graceful labellings.

Section 6.2 Know the definition of a directed graph and a conservative graph. Also, know the statement of Kirchhoff's Current Law. Be able to give a graph a conservative labelling. Know 6.2.2 and be able to use the theorems in this section to give a conservative labelling of a graph.

Format. For this midterm, there will be three types of questions. I will ask you (1) to define some terms, (2) answer some more computational questions and short proof questions, and (3) there will be four proof questions and you will have to pick three. Among these four, I will ask you for the proof for one of the following theorems: Theorem 5.3.1, Theorem 6.1.3, Theorem 6.2.2, or I will ask you to show that $r(3, 3) = 6$ (see Problem on page 81).

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