MTH630: Graph Theory and Combinatorics

Contents

1 Introduction

Topics to cover: Introduction: who am I, what is this course what is a Proof what is graph theory what are the topics we need to cover what depends on what

Acknowledgments

The author would like to thank ...

2 Combinatorics

This is the section on Combinatorics, still to be completed.

3 Set Theory

Definition 3.1. *1. A **Set** is a collection of distinct objects, none of which is the set itself.*

*2. A set containing no elements is called the **empty set**, or the **null set**, and is written $\varnothing$ or $\{\}$.*

*3. A set A is said to be a **subset** of the set B, written $A \subseteq B$ if every element of A is also an element of B.*

*4. A set A is said to be a **equal to** the set B, written $A = B$ if $A \subseteq B$ and $B \subseteq A$.*

Add some discussion about what this means?

Theorem 3.2. *There is only one empty set.*

Lemma 3.3. *(transitivity of subset) If $A \subseteq B$ and $B \subseteq C$, then $A \subseteq C$.*

4 Graphs

This is the section on graphs, still to be completed.

Theorem 4.1. *This is the best theorem!*

5 Planar Graphs

This is the section on planar graphs, still to be completed.