The Title of the Dissertation

DISSERTATION

A dissertation submitted in partial
fulfillment of the requirements for
the degree of Doctor of Philosophy
in the College of Arts and Sciences
at the University of Kentucky

By
Firstname M. Lastname
Lexington, Kentucky

Director: Dr. Doctor McDoctorface, Professor of Mathematics
Lexington, Kentucky
2019

ABSTRACT OF DISSERTATION

The Title of the Dissertation

There should be an abstract here. It is okay if it goes onto the next page, since this occurs in **Dissertation_Template_12.2018.rtf** (click here).

KEYWORDS: up, to, six, keywords

Author's signature:_____ Firstname M. Lastname_

Date:_____ July 27, 2019_

The Title of the Dissertation

By
Firstname M. Lastname

Director of Dissertation:<u>   Dr. Doctor McDoctorface </u>

Director of Graduate Studies:<u>   Dr. DGS Name </u>

Date:<u>   July 27, 2019</u>

Dedicated to all math graduate students everywhere.
Long have you suffered, but now your time has finally come.
This page is optional.

ACKNOWLEDGMENTS

There can optionally be Acknowledgments here. Don't forget to thank your advisor, collaborators, and those who supported you emotionally as well!

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1 How to Finish Grad School

This guide is written by math graduate students, for math graduate students. Please keep it up to date and add any relevant details you learned from your experience. Thanks!

1.1 Helpful Pages & Documents

Be sure to follow the formatting advice in the following resources and be aware of every deadline. The items below are hyperlinks. Click them to find each document on the web.

- Key Dates

- Doctoral Degree Candidate Forms

- Electronic Dissertation Defense

- Electronic Dissertation Preparation

- The Checklist of Common Errors

- FAQ Theses & Dissertations

- Thesis and Dissertation Submission Guide

- UKnowledge

1.2 Steps and Deadlines

Figure out ahead of time what the following deadlines are. I found it helpful to make a checklist and mark them on my calendar.

- **Submit Notification of Intent to Schedule of a Final Doctoral Examination.** This must be submitted a minimum of 8 weeks prior to the anticipated final examination (defense) date.

  Note that the defense must take place no later than 8 days prior to the last day of classes of the semester in which you intend to graduate. Plan accordingly.

  This step can be done with the Doctoral Degree Candidate Forms (click here).

- **Submit Request for Final Doctoral Examination.** This must be submitted a minimum of 2 weeks prior to the date of the defense.

  This step can be done with the Doctoral Degree Candidate Forms (click here).

- **Give a copy of the dissertation to your committee.** Do this at the same time you submit the Request for Final Doctoral Examination. (If you're a bit late on this, no one will likely care, but try to do it anyway in the name of professionalism.)

- **Defend your dissertation.** You set the date for this with your committee in the previous steps. Check out the room ahead of time and make sure all of the technology is working. Don't be late!

- **Complete the Application for Degree on myUK.** This deadline is listed on the Graduate School Calendar (click here).

- **Submit dissertation for format review on UKnowledge.** You have 60 days to submit this after your defense, or less if the deadline to submit thesis/dissertation for format review (click here) is sooner. It will take 2-3 business days to get a response, so plan accordingly. You will most likely have to resubmit with revisions.

  Details for submitting this are in the Thesis and Dissertation Submission Guide (click here).

- **Submit a completed ETD Approval Form (click here) as an Additional File on UKnowledge.** You can do this at the same time as your first dissertation submission for format review, or at a later date.

- **Submit dissertation revisions on UKnowledge.** The last day to submit revised thesis/dissertation is listed on the Graduate School Calendar (click here).

- **Submit confirmation of completing the Survey of Earned Doctorates.** Do this with your revision after receiving the result of your format review (even if no revisions are required). The Thesis and Dissertation Submission Guide (click here) asks you to scan the SED confirmation page at 300dpi. I simply submitted the Certificate of Completion PDF file from the end of the survey, and no one complained.

  At this time, you should email your Degree Certification Officer (click here) to let them know that you have done this step.

1.3 Formatting Your Dissertation

In formatting your dissertation, this template along with **ukthesis.cls** (in the same folder) should handle most of the formatting for you. The **memoir** class is required. If it is not preinstalled with your LaTeX distribution, you will need to install it. This is most easily done by updating your LaTeX distribution (e.g., TeX Live, MiKTeX, or MacTeX), but the class files are located in the **Resources** folder if you wish to install them manually.

I ran into some oddities in formatting my dissertation, which I will list here. Please update this document if you discover anything else worth mentioning.

- Fonts are already embedded in your PDF if you use this template. Additionally, the "Bookmarks Panel and Page" is already chosen in Adobe. You will need Adobe Reader (free) or Adobe Acrobat (paid) to minimize the bookmarked chapters so that sections do not appear when the document is opened. See the Checklist of Common Errors for a picture of this. Just click on the arrows and re-save your document. This must be the final step before submitting to UKnowledge.

- Tables and figures **must** have captions in order to appear in the List of Tables or List of Figures.

- Table captions must appear above the table. To do this, simply put the **caption** command at the top of the **table** environment.

- Figure captions may go above or below. I did below, but you do you, boo.

- Be aware of the table and figure placement requirements on the Electronic Dissertation Preparation page (click here). The graduate school is very particular about this.

- Appendices must be labeled A, B, . . . and have titles.

- Tables and figures in appendices have different requirements. See Appendix B for details.

- Do **not** use the **part** environment for separating your content. Chapters and sections are okay.

- Follow the page order on the Electronic Dissertation Preparation page (click here). This changes from time to time, so if you need to change it please do so in the **ukthesis.cls** file. The Editor's Note at the top of the code will tell you how to do so.

At the end of each chapter should be a copyright notice. And as always, make sure to cite anything you reference, such as [1].

Chapter 2 Some Math I Guess

2.1 Polyhedra

A **polyhedron** is a three-dimensional figure whose faces are all polygons. A polyhedron has **vertices**, **edges**, and **faces**, as shown here:
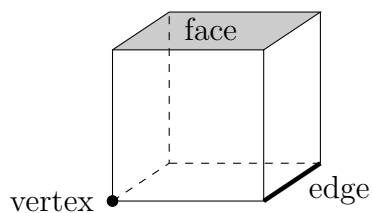

Figure 2.1: A cube has 8 vertices, 12 edges, and 6 faces
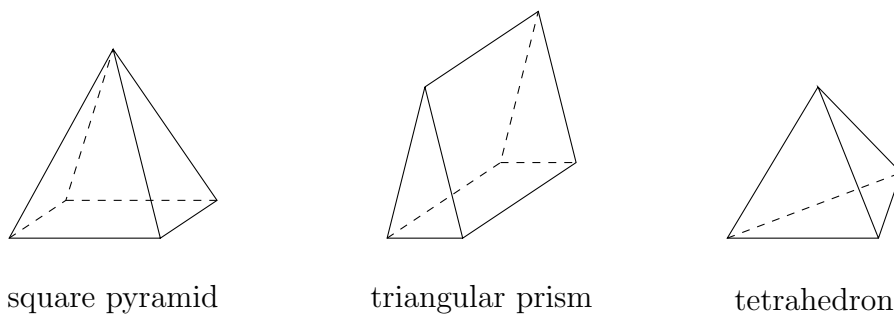
Here are some more polyhedra:

square pyramid   triangular prism   tetrahedron

Figure 2.2: Examples of polyhedra

We organize the numbers of vertices (V), edges (E), and faces (F) into the table below.

Table 2.1: Computing the Euler characteristic

Polyhedron	V	E	F	$V - E + F$
cube	8	12	6	6
square pyramid	5	8	5	2
triangular prism	6	9	5	2
tetrahedron	4	6	4	2

For each polyhedron in the table above, the Euler characteristic $V - E + F$ is 2.

2.2 The Monty Hall Problem

You are on the game show *Let's Make a Deal* and the host Monty Hall presents you with three doors to choose from. Behind two of the doors are goats, but behind one of the doors is a new car! Once your decision is made, Monty opens one of the other two doors to reveal a goat. He then offers you a choice: keep the door you originally chose, or switch to the other door which was not opened. Do you make the switch?

Naively, it may seem that the chance of the car being behind either of the two remaining doors is an even 50/50 split. Most people wouldn't switch doors, out of fear or other psychological factors. However, a wise person would switch. In fact, the probability of winning the car if you switch is 2/3, while the probability of winning if you keep your original door is 1/3.

In your original choice, there is clearly a 2/3 chance that you will pick the wrong door, and only a 1/3 chance that you will pick the correct door. The host would not show you the door with the car, so he is forced to show you a door with a goat. Therefore by switching you are guaranteed to get a goat if you started with the car, and likewise you are guaranteed to get the car if you started with a goat.

$$\text{Your Choice} \begin{cases} \overset{2/3}{\nearrow} & \text{Goat} \overset{\text{switch}}{\longrightarrow} \text{Car} \\ \\ \underset{1/3}{\searrow} & \text{Car} \overset{\text{switch}}{\longrightarrow} \text{Goat} \end{cases}$$
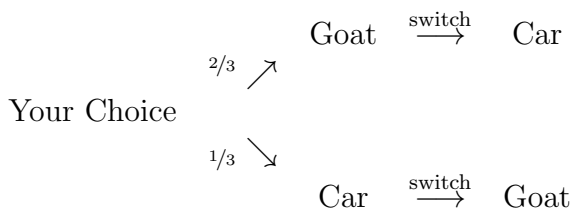
Figure 2.3: Probability tree for the Monty Hall problem

Probability is in your favor if you make the switch!

In an interview [2], Monty Hall explained that he never gave contestants the opportunity to switch doors, so this problem is entirely hypothetical. Nevertheless, his name remains attributed to this phenomenon.

Appendices

Appendix A: Title your appendices

If you have appendices, they must have titles and be labeled alphabetically.

Appendix B: A word about figures

Figures in an appendix should **not** appear in the List of Figures. To achieve this, you can use the **center** environment followed by a **medskip** for appropriate spacing. I believe that the same applies to tables, although I did not confirm this.

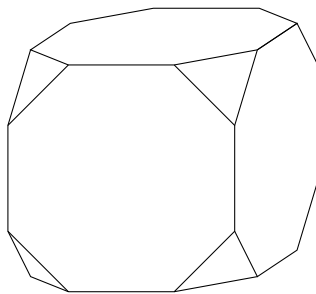The following polyhedron is called a **truncated cube**.

Figure B1: A truncated cube

Furthermore, figures in Appendix A should be labeled A1, A2, ... and figures in Appendix B should be labeled B1, B2, ...

Bibliography

[1] W. Diffie and M. Hellman. New directions in cryptography. *IEEE Transactions on Information Theory*, 22(6):644–654, 1976.

[2] FoundationINTERVIEWS. Monty Hall discusses the Let's Make a Deal Monty Hall math problem. `https://www.youtube.com/watch?v=c1BSkquWkDo`, 2011. [Online; accessed 27-July-2019].

Full Name

Place of Birth:

- City, ST

Education:

- University of Kentucky, City, ST
  M.A. in Mathematics, May. 2006

- Undergraduate University, City, ST
  B.S. in Mathematics, Dec. 2004
  cum laude

Professional Positions:

- Graduate Teaching Assistant, University of Kentucky Fall 2004–Spring 2009

Honors

- Scholarship 1, University of Kentucky

- Fellowship 1, University of Kentucky

- Other Recognition or Award, Northern Kentucky University

Publications & Preprints:

- Puplication 1

- Preprint 1