Note to Students

This book may be different than other mathematics textbooks you have used in the past. In this book, the reader is expected to do more than read the book and is expected to study the material in the book by working out examples rather than just reading about them. So this book is not just about mathematical content but is also about the process of learning and doing mathematics. Along the way, you will also learn some important mathematical topics that will help you in your future study of mathematics.

This book is designed not to be just casually read but rather to be *engaged*. It may seem like a cliché (because it is in almost every mathematics book now) but there is truth in the statement that *mathematics is not a spectator sport*. To learn and understand mathematics, you must *engage* in the process of doing mathematics. So you must actively read and study the book, which means to have a pencil and paper with you and be willing to follow along and fill in missing details. This type of engagement is not easy and is often frustrating, but if you do so, you will learn a great deal about mathematics and more importantly, about doing mathematics.

Recognizing that actively studying a mathematics book is often not easy, several features of the textbook have been designed to help you become more engaged as you study the material. Some of the features are:

- **Beginning Activities.** The introductory material in almost every section of this book contains a so-called beginning activity. Some beginning activities will review prior mathematical work that is necessary for the new section. This prior work may contain material from previous mathematical courses or it may contain material covered earlier in this text. Other beginning activities will introduce new concepts and definitions that will be used later in that section. It is very important that you work on these beginning activities before starting the rest of the section. Please note that answers to these beginning activities are not included in the text, but the answers will be developed in the material later in that section.

- **Focus Questions.** At the start of each section, we list some focus questions that provide information about what is important and what ideas are the main focus of the section. A good goal for studying section is to be able answer each of the focus questions.

- **Progress Checks.** Several Progress Checks are included in each section. These are either short exercises or short activities designed to help you determine if you are understanding the material as you are studying the material in the section. As such, it is important to work through these progress checks to test your understanding, and if necessary, study the material again before proceeding further. So it is important to attempt these progress checks before checking the answers, which are are provided in Appendix A.

- **Section Summaries.** To assist you with studying the material in the text, there is a summary at the end of each of the sections. The summaries usually list the important definitions introduced in the section and the important results proven in the section. In addition, although not given in a list, the section summaries should contain answers to the focus questions given at the beginning of the section.

- **Answers for Selected Exercises.** Answers or hints for several exercises are included in an Appendix B. Those exercises with an answer or a hint in the appendix are preceded by a star ($\star$).

- **Interactive Geogebra Applets.** The text contains links to several interactive Geogebra applets or worksheets. These are active links in the pdf version of the textbook, so clicking on the link will take you directly to the applet. Short URL's for these links have been created so that they are easier to enter if you are using a printed copy of the textbook.

  Following is a link to the GVSU MTH 123 playlist of Geogebra applets on the Geogebra website. (MTH 123 is the trigonometry course at Grand Valley State University.)

  http://gvsu.edu/s/Ov

  These applets are usually part of a beginning activity or a progress check and are intended to be used as part of the textbook. See page 15 for an example of a link to an applet on the Geogebra website. This one is part of Progress Check 1.6 and is intended to reinforce the unit circle definitions of the cosine and sine functions.

- **Video Screencasts.** Although not part of the textbook, there are several online videos (on YouTube) that can be used in conjunction with this textbook. There are two sources for video screencasts.

  1. The MTH 123 Playlist on Grand Valley's Department of Mathematics YouTube channel:

     http://gvsu.edu/s/MJ

     Note: MTH 123 is the course number for the trigonometry course at Grand Valley State University.

  2. MTH 123 video screencasts on *Rocket Math 1*. These video screencasts were created by Lynne Mannard, an affiliate faculty member in the Department of Mathematics at Grand Valley State University.

     http://gvsu.edu/s/0cc