*"Wahrlich es ist nicht das Wissen, sondern das Lernen,*
*nicht das Besitzen, sondern das Erwerben,*
*nicht das Da-Seyn, sondern das Hinkommen,*
*was den grössten Genuss gewährt"*

*"It is not knowing, rather learning,*
*not possessing, rather obtaining,*
*not being present, rather reaching there,*
*which serves the greatest joy."*

— Carl Friedrich Gauss

03.04.2021

# Foreword

The extent and applications of mathematics are enormous, but a fair share of it is funded on a manageable amount of principles, and these i want to present in this book. I have chosen to call a principle in summarized form a *rule*. You will find the rules in blue text-box, usually followed by an example of its usage. One of the main targets of this book is presenting the logic justification of the rules. In Chapter 1 - 5 you will find explenations[1] preceding every rule, while in chapter 6 some explanations are found directly after the stating of the rules (and eventual examples). As of chapter 7, some explanations are found in a concluding section named *Explanations*. This indicates that they are rather intricate and/or such intuitively true that many will find the explanation superfluous.

**The structure of the book**
The book consists of a *Part I* and a *Part II*. *Part I* focuses on the basic understanding of the numbers and operations of calculation. *Part II* introduces the concept of algebra and the closely related topics of powers, equations and functions. In addition, both *Part I* and *Part II* ends with a chapter on geometry.

*Notice! You will not find practice problems and applications of mathematics in real life in this book. These are two very important elements to come, either integrated in this book or as an independent document.*

**A note on convention**
Although I am very much aware of the convention of writing commas and dots in center-aligned equations, I opted against this[2]. In this way, a center-aligned equation is a grammatical hybrid; it can end with both an invisible comma or dot, or nothing at all.

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[1]To *explain* the rules rather than *proving* them is a delibirate decision. A proof demands a mathematical rigour that often forces a lot of assumptions and definitions being stated along the way. This can make the main insight disappear in the crowd of details. However, some of the explenations are valid as proofs.

[2]I've never liked the looks of it.

Dear reader.

This book i free of charge but I've used a lot of time and resources in creating it. I really want to continue creating books which makes mathematics available for free, but it can turn out quite difficult if there is no income connected to it. Therefore, if you like this book, I hope you can donate a small sum using PayPal. Thank you in advance!

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