Preface to *Conics* by Apollonius[1]

Apollonius to Eudemus, greeting.

If you are in good health and things are in other respects as you wish, it is well; with me too things are moderately well. During the time I spent with you at Pergamum I observed your eagerness to become acquainted with my work in conics; I am therefore sending the first book, which I have corrected, and I will forward the remaining books when I have finished them to my satisfaction. I dare say you have not forgotten my telling you that I undertook the investigation of this subject at the request of Naucrates the geometer, at the time when he came to Alexandria and stayed with me, and, when I had worked it out in eight books, I gave them to him at once, too hurriedly, because he was on the point of sailing; they had therefore not been thoroughly revised, indeed I had put down everything just as it occurred to me, postponing revision till the end. Accordingly I now publish, as opportunities serve from time to time, instalments of the work as they are corrected. In the meantime it has happened that some other persons also, among those whom I have met, have got the first and second books before they were corrected; do not be surprised therefore if you come across them in a different shape.

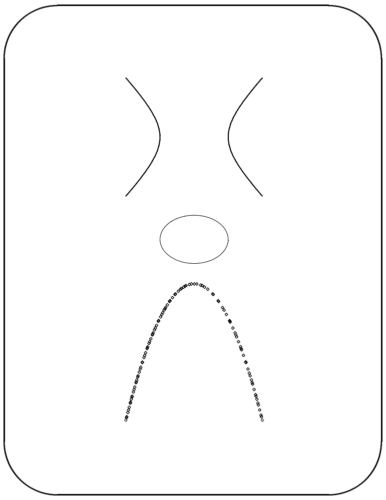

Figure 1: Conic Sections

Now of the eight books the first four form an elementary introduction. The first contains the modes of producing the three sections and the opposite branches of the hyperbola, and the fundamental properties subsisting in them, worked out more fully and generally than in the writings of others. The second book contains the properties of the diameters and axes of the sections as well as the asymptotes, with other things needed for determining limits of possibility; and what I mean by diameters and axes you will learn from this book. The third book contains many remarkable theorems useful for the construction of solid loci and for limits of possibility; the largest number and most beautiful of these theorems are new, and it was their discovery which made me aware that Euclid did not work out the construction of the locus with respect to three and four lines, but only a chance portion of it and that not successfully; for it was not possible for the said construction to be completed without the aid of the additional theorems discovered by me. The fourth book shows in how many ways the sections of cones can meet one another and the circumference of a circle; it contains other things in addition, none of which have been discussed by earlier writers, namely the questions in how many

[1] As given by George F. Simmons, *Calculus Gems*, McGraw-Hill, New York, 1992, pages 50–51.

points a section of a cone or a circumference of a circle can meet a double-branch hyperbola, or two double-branch hyperbolas can meet one another.

The rest of the books are more specialized: one of them deals somewhat fully with *minima* and *maxima*, another with equal and similar sections of cones, another with theorems of the nature of determinations of limits, and the last with determinate conic problems. But of course, when all of them are published, it will be open to all who read them to form their own judgement about them, according to their own individual tastes. Farewell.