

BEGINNING ALGEBRA: ARITHMETIC IN DISGUISE

William R. Livingston

Missouri Southern State College

I come to you with good news! Your students need not fear Beginning Algebra! It is only Arithmetic in Disguise. By this I mean that it is the rules of arithmetic in symbolic form which are applied to the solution of verbal problems. These problems are, of course, arithmetic problems.

Since it is possible that you may not believe this, I have three arguments that will help to convince you. I will also give four conclusions that I deduce from it. But before I do this, let me put my remarks in perspective.

Algebra can be seen from different perspectives. Its meaning depends on your professional goals when you study it and has taken on different meanings in certain historical periods.

To the beginner it is a maze to be traversed and from which he hopefully will gain some useful knowledge. To the non-mathematics professional it is a tool to be mastered and used occasionally. To the mathematician it is an essential part of his training that has strong connections with Topology, Analysis, and Applied Mathematics.

Similar observations may be made about the historical development of the discipline. In its earlier stages, it is little more than an arithmetic device for solving practical problems. In the Renaissance, it is developed for its own sake. Its practitioners of this period solved the cubic and quartic equations in terms of radicals. This will lead their followers to ask if the same can be accomplished for those of degree five and higher and will ultimately help pave the way for the blooming of Abstract Algebra in the nineteenth and twentieth centuries. In the seventeenth and eighteenth centuries it is a tool to be used in the development of Analysis which will be used to solve many problems in Physics.

I wish to look at the subject through the eyes of the beginner which historically means that we need only concern ourselves with the earliest history of Algebra. This point of view will be defended in terms of the content of the course, the historical development of the subject, and on pedagogical grounds.

First, I shall discuss the content of the course. It deals with