THE METHOD OF CONSTRUCTING MAGIC SQUARES

by

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ABSTRACT

This Thesis describes methods of constructing magic squares of every order by the use of some congruence properties in number theory and by the use of orthogonal Latin squares. It is divided into five chapters. The first chapter is an introduction, containing a definition of what a magic square is and a brief history of the subject. The next chapter contains the solution of a text book problem and then continues to find the sufficient conditions for constructing magic squares of any odd order. By the method discussed in this chapter one may write down at once the numbers in the square that make a magic square. Chapter III discusses the number of magic squares of a given odd order that can be constructed by the method in the previous chapter. The next chapter deals with some properties of the magic squares. This chapter shows the relation between the magic squares and the Latin squares which find application in experimental design. It also shows the method of constructing orthogonal Latin squares from magic squares. The last chapter indicates the method of constructing a magic square of any even order in which there are two categories, the doubly even and singly even orders. The magic squares of doubly even order are constructed by using some properties of magic squares discussed in the previous chapter and properties of finite fields in modern algebra. Then by the method of bordered squares, the singly even order magic squares can be constructed from the doubly even order magic squares.

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CONTENT

LIST OF FIGURES