## NUMBER SYSTEM AND SETS

**Mathematics** is a basic tool in our daily life. Some use of mathematics is found in every rating in the study, from the simple arithmetic of counting for inventory purposes to the complicated equations encountered in computer and engineering work.

Storekeepers need mathematical computation in their bookkeeping. Damage Control men need mathematics to compute stress, centers of gravity, and maximum permissible rolls. Electronics principles are frequently stated by means of mathematical formulas.

**Navigation** and engineering also use mathematics to a great extent. In such a way Defense warfare becomes more and more complex mathematics achieves ever increasing importances an essential tool.

**From** the point of view of the individual there are many incentives for learning the subject. Mathematics better equips us to do his present works. It will help us in attaining promotions and the corresponding pay increases. Statistically it has been found that one of the best indicators of a man's potential success as a learner is his understanding of mathematics. This topic begins with the basic facts of arithmetic and continues through some of the early stages of algebra.

An attempt is made throughout to give an understanding of why the rules of mathematics are true. This is done because it is felt that rules are easier to learn and remember if the ideas that led to their development are understood.

Many of us have areas in our mathematics background that are hazy, barely understood, or troublesome. Thus, while it may at first seem beneath your dignity to read chapters on fundamental arithmetic, these basic concepts may be just the spots where your difficulties lie. These chapters attempt to treat the subject on an adult level that will be interesting and informative.

## **DECIMAL SYSTEM**

In the decimal system, each digit position in a number has ten times the value of the position adjacent to it on the right. For example, in the number 11, the 1 on the left is said to be in the "tens place," and its value is 10 times as great as that of the 1 on the right. The 1 on the right is said to be in the "units place," with the understanding that the term "unit" in our system refers to the numeral 1. Thus the number 11 is actually a coded symbol which means "one ten plus one unit." Since ten plus one is eleven, the symbol 11 represents the number eleven.



Figure A-1 – Names of Digit Positions.

**Figure** A-1 shows the names of several digit positions in the decimal system. If we apply this nomenclature to the digits of the integer 235, then this number symbol means "two hundred plus three tens plus five units."

The number may be expressed in mathematical symbols as follows:

## 2 \* 10 \*10 + 3 \* 10 + 5 \* 1

**Notice** that this bears out our earlier statement: each digit position has 10 times the value of the position adjacent to it on the right.