11/1/2007, Dr. S. Aranoff

For reference (your reference and my reference) :

Definition of prime numbers:

Let N be the set of natural numbers: $N = \{1, 2, 3, ...\}$.

Let I be the set of integers: $I = \{..., -1, 0, 1, ...\}$.

Let P be the set of prime numbers.

$P \subset N$.

$P \subset I$, as every element in P is also in I.

$n(P) = n(N) = n(I) = \aleph_0$

a is **divisible** by b if $a, b \in N$ and $\exists k \ni k \in N$ and $a = bk$.

Subsets.

The problem here is to find the number of subsets of a set.

Let us define $S_n = \{1, 2, 3, \ldots, n\}$. How many subsets does S_n have?

For $n = 0$, the number of subsets is 1. The subset is $\{ \ \}$.

For $n = 1$, we have all the subsets for $n = 0$, and also subsets with 1.

The additional subset is $\{1\}$. We have $2 = 2^1$ subsets.

For $n = 2$, we have all the subsets for $n = 1$.

In addition, we add 2 to each subset to get more subsets. This doubles the subsets.

We have $2 \times 2 = 2^2$ subsets.

In general, for any n, the number of subsets is 2^n.