## **Abstract in English**

In this dissertation, we present algorithms and theorems relevant to the enumeration of various classes of monotone Boolean functions. This work consists of four papers, three published in peer-reviewed journals and one under review.

We denote the number of monotone Boolean functions of n variables as  $d_n$ . Two monotone Boolean functions are said to be equivalent if one can be obtained from the other function through any permutation of input variables. Let  $r_n$  denote the number of inequivalent monotone Boolean functions of n variables. By  $\lambda_n$  we denote the number of self-dual monotone Boolean functions of n variables, and by  $q_n$  we denote the number of inequivalent self-dual monotone Boolean functions of n variables.

In Paper A we calculate the value:

 $r_8 = 1392195548889993358.$ 

In Paper B we prove the congruence:

$$d_9 \equiv 6 \pmod{210}.$$

In Paper C, we calculate the value:

 $r_9 = 789204635842035040527740846300252680.$ 

In Paper D, we confirm the previously known result:

$$\lambda_9 = 423295099074735261880,$$

and we calculate:

$$q_8 = 6001501$$