Exercise 1

Carry:

A B \ C	0	1
0 0	0	0
0 1	0	1
1 1	1	1
1 0	0	1

$$AB + BC + AC = (A+C).(B+C)(A+B)$$

Sum:

AB \ C	0	1
0 0	0	1
0 1	1	0
1 1	0	1
1 0	1	0

$$\bar{A}B\bar{C} + A\bar{B}\bar{C} + \bar{A}\bar{B}C + ABC = (A+B+C)(A+\bar{B}+\bar{C})(\bar{A}+B+\bar{C})(\bar{A}+\bar{B}+C)$$

Half Adder and Half Subtractor

A	B	Sum	Carry	Diff	Borrow
0	0	0	0	0	0
0	1	1	0	1	1
1	0	1	0	1	0
1	1	0	1	0	0

Full Adder and Full Subtractor

A	B	C	Sum	Carry	Diff	Borrow
0	0	0	0	0	0	0
0	0	1	1	0	1	1
0	1	0	1	0	1	1
0	1	1	0	1	0	1
1	0	0	1	0	1	0
1	0	1	0	1	0	0
1	1	0	0	1	0	0
1	1	1	1	1	1	1