Circuits

The following is an OR circuit.

![OR circuit](image1)

Figure 1: OR circuit

The following is an AND circuit.

![AND circuit](image2)

Figure 2: AND circuit
The following is a NOT circuit.

![Figure 3: NOT circuit](image1)

### Combinatorial Circuits

The following are AND, OR, and NOT gates.

![Figure 4: AND, OR, and NOT gates](image2)

A *combinatorial circuit* is a circuit with AND, OR, and NOT gates.

### Binary Representation

**Definition:** A *binary representation* of a number $z$ is its numeric representation in base 2, namely

$$z = a_n2^n + a_{n-1}2^{n-1} + \ldots + a_12^1 + a_02^0$$

where $a_i \in \{0,1\} \ \forall i$. 
