



El futuro digital  
es de todos

MinTIC

«Mision  
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## Worksheet 7.1

Read the paragraph, then try to figure out the meaning of the highlighted words without using the dictionary.

*Boolean algebra is a division of mathematics that **deals with** operations on logical values and incorporates binary variables. Boolean algebra **traces** its origins to an 1854 book by mathematician George Boole.*

*The **distinguishing** factor of Boolean algebra is that it **deals only with** the study of binary variables. Most commonly Boolean variables are presented with the possible values of 1 ("true") or 0 ("false"). Variables can also have more complex interpretations. Boolean algebra is also **known** as binary algebra.*

## Worksheet 7.2

Read the following text highlight the words you don't know and try to infer the meaning from the context without using a dictionary.

### Boolean Algebra

Boolean Algebra is fundamental to the operation of software and hardware. If you are in IT, then Boolean Algebra is very important for you. Boolean Algebra is a form to formally specify, or describe, a particular situation or procedure. We use **variables** to represent elements of our situation or procedure. Variables can take one of only two values: **True** and **False**. So for example, we have a variable **X** that represents "if it is raining outside or not". The value of **X** is:

- **True** if it is raining outside.
- **False** if it is not raining outside.

It is possible to substitute True and False with other values. When working with computers, True and False is often replaced with **1** and **0**.

### Basic Operations

There are three basic operations. The result of an operation can only be **True** or **False**.

#### 1. AND

The first operation is **AND**. So for example, I can say, "If it's hot outside **AND** I finished my work, then I will play soccer." To represent this in Boolean Algebra, I can say that:

- **x** represents *if it is hot outside or not*.
- **y** represents *if I finished my work or not*.
- **z** represents *if I play soccer or not*.

**x AND y = z**

Let's look at the representation of this operation using a Truth table. A truth table is a list of all the possible combinations of inputs and outputs.

<b>X</b>	<b>Y</b>	<b>Result</b>
False	False	False
True	False	False
False	True	False
True	True	True

## **2. OR**

**OR** means that if one of the two variables is **True** then the result is **True**. So for example, I can say that "I will get home early if I finish work early **OR** the traffic is good". To represent this in Boolean Algebra, I can say that:

- **x** represents *if finish work early*.
- **y** represents *if the traffic is good*.
- **z** represents *if I get home early*.

$$x \text{ OR } y = z$$

Here is the representation in a truth table:

X	Y	Result
False	False	False
True	False	True
False	True	True
True	True	True

### 3. Not

**Not** has the effect of changing the value of a variable to the opposite. For example, I can say: "If I am not full, I will eat a cake." To represent this in Boolean algebra, I will write:

- **d** represents *if I am full*
- **e** represents *if I eat a cake*
- the variable **d** currently has a value of **True** then
- the expression **not d** has a result of **False**

And as a truth table:

X	Result
True	False
False	True

## Worksheet 7.3

**Fill out the following self-evaluation**

1. Entiendo cómo puedo tratar de entender el significado de las nuevas palabras sin consultar el diccionario.  
Si ☐ No ☐ Tal vez :|
2. La estrategia de “inferring” me ayuda a entender el texto que leo mejor.  
Si ☐ No ☐ Tal vez :|
3. Pude entender qué es Boolean Algebra.  
Si ☐ No ☐ Tal vez :|