

# Algèbre de Boole

## 2.1 Notions théoriques

### 2.1.1 Axiomes et postulats

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$$\begin{array}{r}
 a b c \\
 a b \quad b a \\
 a b c \quad a b c \\
 \overline{a b c} \quad \overline{a b c} \\
 a \quad \overline{a} \\
 a \quad \overline{a}
 \end{array}
 \qquad
 \begin{array}{r}
 \overline{a b} \quad \overline{b a} \\
 \overline{a b} \cdot c \quad \overline{a b c} \\
 a \quad \overline{b c} \quad a b \cdot a c \\
 \overline{a} \quad a \\
 \overline{a} \quad \overline{a}
 \end{array}$$

2.1.2 Principe de dualité

$$a \qquad a a a$$

$$\begin{array}{l}
 a a \quad \cdot a \quad \cdot a \\
 a a \quad a \cdot \\
 a a \quad a \cdot \\
 a+a \quad a
 \end{array}$$

$$a \qquad a \cdot a \quad a$$

$$\begin{array}{l}
 a \cdot a \quad a \cdot \quad a \\
 a \cdot a \quad a \cdot \\
 a \cdot a \quad a \\
 a \cdot a \quad a
 \end{array}$$

$$a \quad b$$

$$a \quad \overline{a} \cdot b \quad a \quad b$$

$$a \quad b$$

$$a \cdot \overline{a} \quad b \quad a \cdot b$$

2.1.3 Théorèmes de base

$a \quad b$

	Forme 1	Forme 2	Nom (si existe)
	$\overline{\overline{a}} \quad a$	$\overline{\quad}$	
	$a \quad a \quad a$	$\overline{a} \quad a \quad a$	
	$a$	$\overline{a}$	
	$\frac{a \quad \overline{a} \quad b \quad a}{a+b = \overline{a} \cdot \overline{b}}$	$\frac{\overline{a} \quad a \quad b \quad a}{\overline{a \cdot b} \quad \overline{a} \quad \overline{b}}$	
	$a \quad \overline{a} \cdot b \quad a \quad b$	$a \cdot \overline{a} \quad b \quad a \cdot b$	

$a$

$a$

$a \quad a \quad a \quad \overline{a}$   
 $a \quad a \quad a \quad \overline{a}$   
 $a \quad a \quad \overline{a}$   
 $a$

$a \quad b$

$a \cdot a \quad b$

$a \cdot a \quad b \quad a \quad \cdot \quad a \quad b$   
 $a \cdot a \quad b \quad a \quad \cdot \quad b$   
 $a \cdot a \quad b \quad a$   
 $a \cdot a \quad b \quad a$

$$a \cdot b \qquad a \cdot \overline{a} \cdot b \quad a \cdot b$$

$$\begin{aligned}
 a \cdot \overline{a} \cdot b &= a \cdot \overline{a} \cdot b \\
 a \cdot \overline{a} \cdot b &= a \cdot b \cdot \overline{b} \cdot \overline{a} \cdot b \\
 a \cdot \overline{a} \cdot b &= a \cdot b \cdot a \cdot \overline{b} \cdot \overline{a} \cdot b \\
 a \cdot \overline{a} \cdot b &= a \cdot b \cdot a \cdot b \cdot a \cdot \overline{b} \cdot \overline{a} \cdot b \\
 a \cdot \overline{a} \cdot b &= a \cdot b \cdot a \cdot \overline{b} \cdot a \cdot b \cdot \overline{a} \cdot b \\
 a \cdot \overline{a} \cdot b &= a + b \cdot \overline{b} \cdot a \cdot \overline{a} \\
 a \cdot \overline{a} \cdot b &= a + \quad b \\
 a \cdot \overline{a} \cdot b &= a \cdot b
 \end{aligned}$$

*évidents*

### 2.1.4 Considérations sur la notation

$$\begin{aligned}
 a \cdot b \cdot c &= a \cdot b \cdot c \cdot x \cdot y \\
 ab &= a \cdot b \\
 a \cdot bc &= a \cdot b \cdot c \\
 a \cdot b \cdot c &= a \cdot b \cdot c
 \end{aligned}$$

$$a \cdot b \cdot c \cdot d \qquad a \cdot b \cdot c \cdot d$$

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$$a \cdot a \cdot b \quad a \cdot a \cdot a \cdot b \quad a \cdot a \cdot b \cdot a \quad a \cdot a \cdot b \cdot a$$

$$a \cdot a \cdot b \cdot a$$

$$a \cdot a \cdot b \cdot a$$

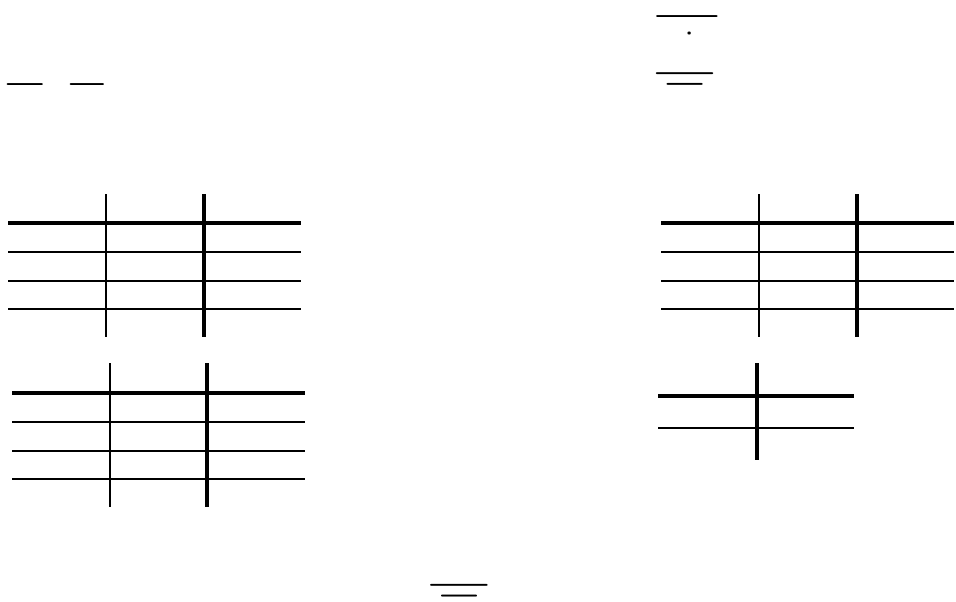


$$f \quad b \quad \overline{+b} \quad \overline{b}$$

$$f \quad b \quad \overline{b} \quad \overline{\quad}$$

$$f \quad a \quad b \quad \overline{a} \quad \overline{b} \cdot +a \cdot = \overline{a} \quad \overline{b}$$

2.1.6 Table de vérité



*deux fonctions sont équivalentes si et seulement si elles possèdent la même table de vérité*

The image contains four empty 5x10 grid tables arranged in a 2x2 layout. Each grid is defined by a thick horizontal line at the top and a thick vertical line on the right side, with four vertical lines and nine horizontal lines forming the grid structure.

2.1.7 Table de vérité des opérateurs logiques

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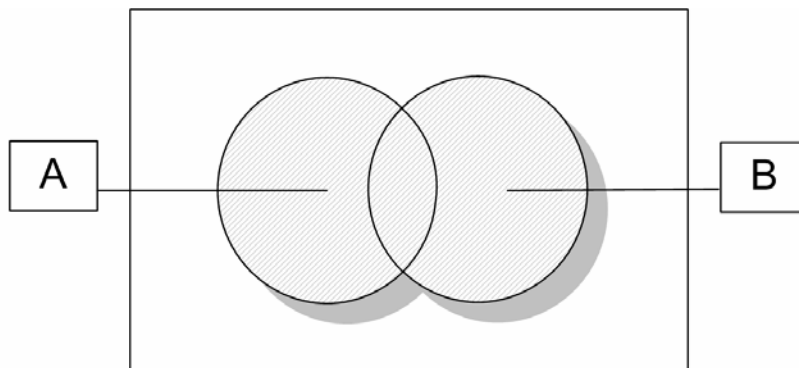
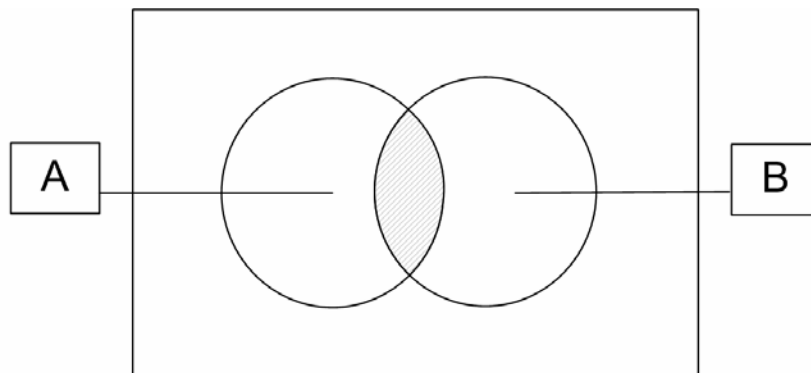
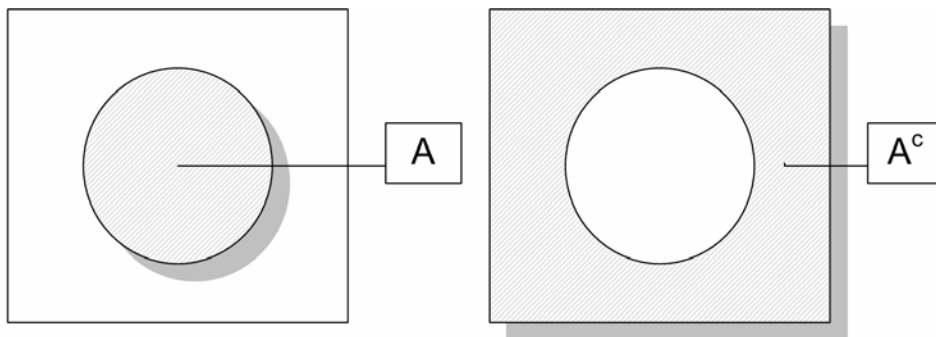
An empty 3x3 grid table with a thick horizontal line at the top and a thick vertical line on the right side.

An empty 3x3 grid table with a thick horizontal line at the top and a thick vertical line on the right side.

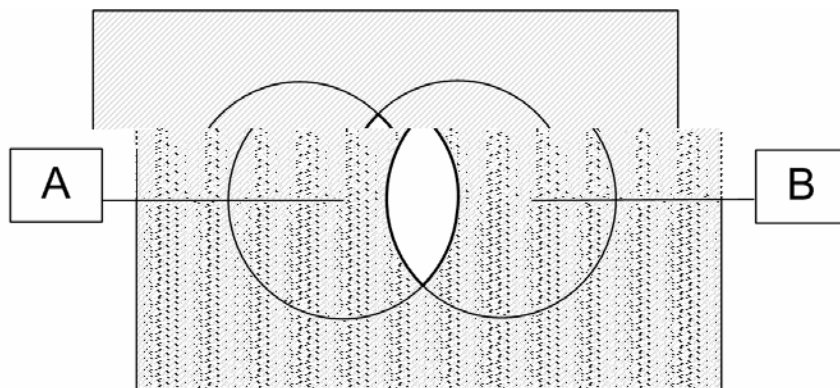
An empty 2x2 grid table with a thick horizontal line at the top and a thick vertical line on the right side.

*uniquement*

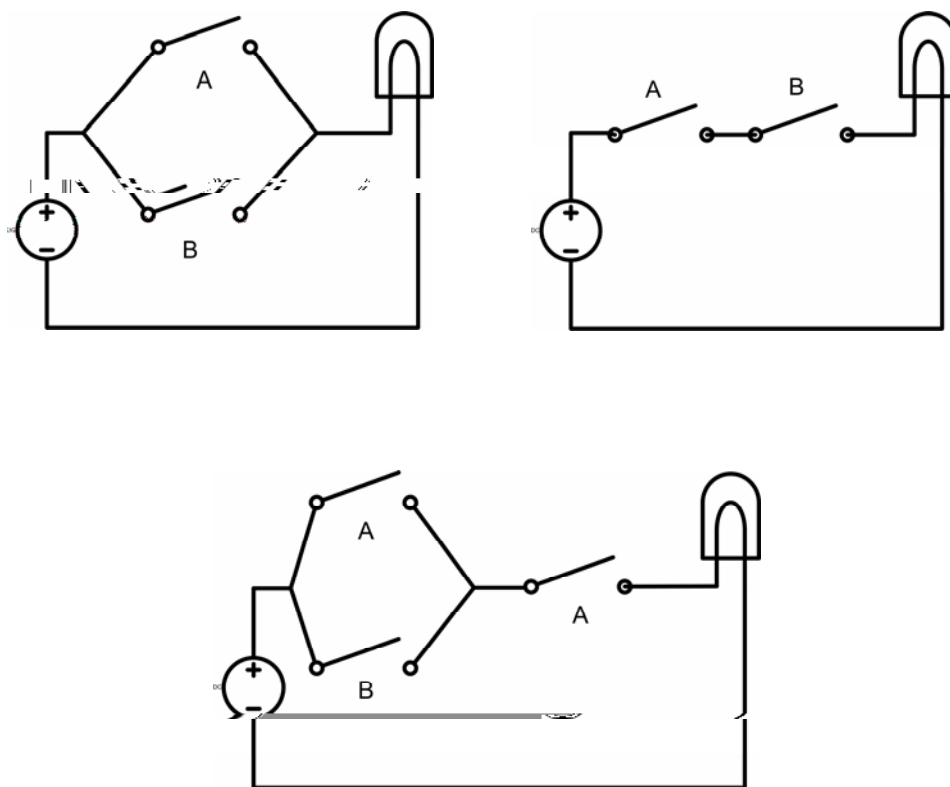
2.1.8 Diagrammes de Venn et cercles d'Euler



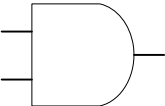
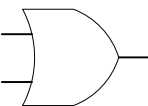
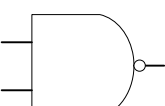
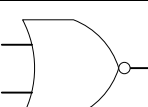
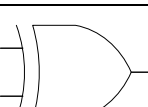

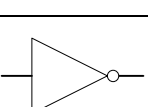




## 2.2 Notions de circuits logiques



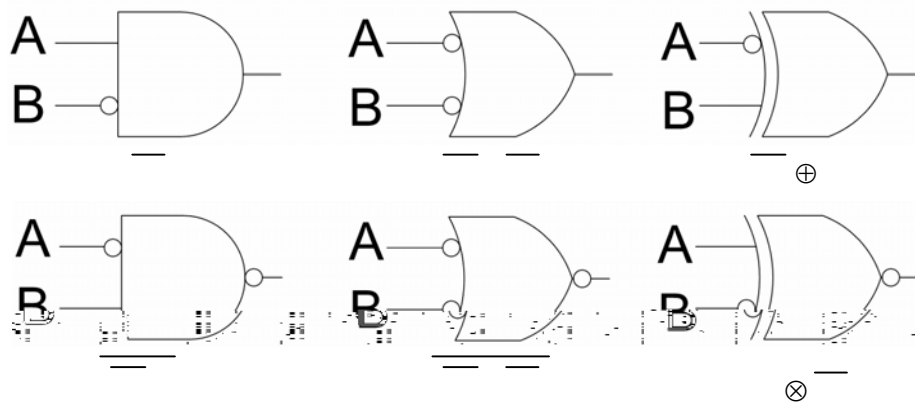
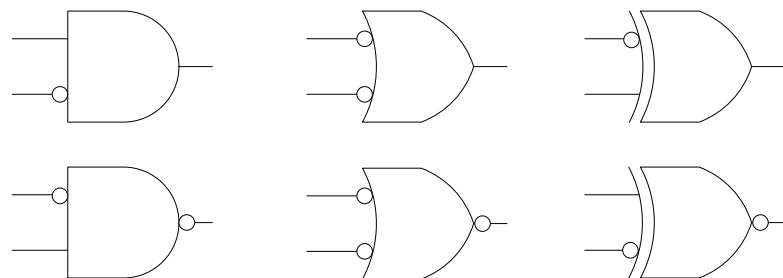
2.2.1 Portes logiques

Opérateur logique	Nom français	Nom anglais	Symbole	Table de vérité												
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2.2.3 Inversion des entrées





2.2.6 Synthèse de circuit logique (notions)

*réalisée* *réaliser*

