HOMEWORK

EXERCICE 1

Determine the values of A, B, C, and D that makes this expression **false**:

```
!A and B and  !C and D
```

A. A = 1, B = 0, C = 0, D = 0 false
B. A = 1, B = 0, C = 1, D = 0 true
C. A = 0, B = 1, C = 0, D = 0 false
D. A = 1, B = 0, C = 1, D = 1 false

EXERCICE 2

Determine the values of A, B, C, and D that makes this expression **true**:

```
!A . B . !C . D
```

A. A = 0, B = 1, C = 0, D = 1 true
B. A = 0, B = 0, C = 0, D = 1 false
C. A = 1, B = 1, C = 1, D = 1 false
D. A = 0, B = 0, C = 1, D = 0 false

EXERCICE 3

True or false?

```
AC + ABC = AC  true
```

To solve this problem:

1- Try using a TRUTH table

A	B	C	AC + ABC	AC
False	false	false	false	False
false	True	False	false	false
True	true	false	false	False
True	True	True	True	True
True	False	False	False	False

2- Try using the 7 rules of simplification

AC + ABC = AC or (AC and B)
= AC and (B or True)
= AC and True
= AC

EXERCICE 5

True or false?

A + AB = A true

To solve this problem:

1- Try using a TRUTH table

A	B	A+ AB
False	True	False
False	False	False
True	False	False
True	True	True

2- Try using the 7 rules of simplification

A + AB = A or (A and B)
= A and (B or True)
= A and true

EXERCICE 6

True or false?

```
A +  !AB = A + B
```

To solve this problem:

1- Try using a TRUTH table

A	B	A+ !AB	A+B
False	False	False	False
False	True	True	True
True	True	true	True
True	False	True	true

2- Try using the 7 rules of simplification

A + !AB = A or (!A and B)
= A or B
=A + B

In the following exercises: you need to use the table of truth to simplify the expression as much as possible

EX-14

```
A == True and (B == False or A == False) and B == True
```

a	b	a == True and (b == False or a == False) and b == True
True	True	True==True and (True==False or True == False) and True ==False :true
True	False	True==True and (False==False or True == False) and False == True : False
False	True	False == True and (True == False or False == false) and True == True: False
False	False	False == true and (False == False or False == False) and False == True: False

The expression is equivalent to:

A == A and (B == !B or A == !B) and A ==!A
A == A and (B == B or A == !A) and B ==A
A == !A and (B == !B or A == A) and B == B
A == !A and (A == A or B == B) and A == !A

EX-15

```
(A == True and B == False) or (A == False and B == True)
```

a	b	(a == True and b == False) or (a == False and b == True)
True	True	(True== True and True == False) or (True == False and True==true)
True	False	(True==True and False==False) or (True==False and False==True)
False	True	(False== True and True== False) or (False==False and True==True)
False	False	(False==true and False==False) or (False ==False and False==true)

The expression is equivalent to:
(A==A and A ==!A) or (A == !A and A==A)
(A==A and B==B) or (A== !A and B==!B)
(A==!A and B==!B) or (A==A and B == B)
(A == !A and B==B) or (A == A and B == !B or == !A)

EX-16

```
(B or !B) and A
```

a	b	(B or ! B) and A
True	True	(True or ! true) and true
True	False	(False or ! false) and true
False	True	(true or ! true) and false
False	False	(false or ! true) and false

The expression is equivalent to:
(A or ! A and !B) and A or B
(B or !B) and A