# C3- S2 EXERCICES

EQUALITY OF EXPRESSIONS

In these exercises a and b are Boolean: they can be True or False

1. Find if the Boolean expression is True or False for all possible values of a and b by filling in the truth table
2. Simplify the expression by removing the redundant conditions

EX-1

A and False

|  |  |
| --- | --- |
| **A** | **A and False** |
| False | False |
| True | False |

From this truth table, write the equivalence of the Boolean expression

A and False = False

EX-2

A and True

|  |  |
| --- | --- |
| **A** | **A and True** |
| False | False |
| True | True |

From this truth table, write the equivalence of the Boolean expression

A and True = If A=True so A and True = true

If A= False so A and True =false

EX-3

A or A or A

|  |  |
| --- | --- |
| **A** | **A or A or A** |
| False | False |
| True | False |

From this truth table, write the equivalence of the Boolean expression

A or A or A = If A = false so A or A or A = False

If A = True so A or A or A = True

EX-4

A and A and A

|  |  |
| --- | --- |
| **A** | **A** and **A** and **A** |
| False | False |
| True | True |

From this truth table, write the equivalence of the Boolean expression

A and A and A = If A = True so A and A and A = true

= If A = False so A and A and A = False

EX-5

not ( not A)

|  |  |
| --- | --- |
| **A** | **not ( not A )** |
| False | False |
| True | True |

From this truth table, write the equivalence of the Boolean expression

**not ( not A)** = If A = false so not(not A) = False

If A = True so not(not A) = True

EX-6

not (A or B)

|  |  |  |  |
| --- | --- | --- | --- |
| **A** | **B** | **not (A or B)** | **notA and notB** |
| False | False | True | True |
| False | True | False | True |
| True | False | False | True |
| True | True | False | False |

From this truth table, write the equivalence of the Boolean expression

**not (A or B)** = If A = False and B = False so not(A or B) = true

If A = True and B = True so not(A or B) = False

If A = True and B = False so not(A or B) = False

If A = False and B =True so not(A or B) = False

notA and notB = If A = True and B = True so notA and notB = False

If A = False and B = False so notA and notB =True

If A = False and B = True so notA and notB = True

If A = True and B = False so notA and notB = True