# C3- S3 EXERCICES

SIMPLIFICATIONS

In the following exercises:

1. Demonstrate this equality using the 7 simplification rules you have learnt
2. Confirm this equality with the TRUTH table

EX-7

A and (A or B) = A

|  |  |  |
| --- | --- | --- |
| **a** | **b** | **A and (A or B)= A** |
| false | false | false |
| False | true | false |
| true | false | true |
| true | true | true |

A and (A or B) = A

EX-8

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

|  |  |  |
| --- | --- | --- |
| **a** | **b** | **(A and B) or (A and !B)** |
| false | false | false |
| False | true | false |
| true | false | true |
| true | true | true |

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

EX-9

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

|  |  |  |  |
| --- | --- | --- | --- |
| **a** | **b** | **A and B** | A and (!A or B) |
| false | false | false | false |
| false | true | false | false |
| true | false | false | false |
| true | true | true | true |

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

EX-10

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

|  |  |  |  |
| --- | --- | --- | --- |
| **a** | **b** | **A or B** | A or (!A and B) |
| false | false | false | false |
| false | true | true | true |
| true | false | true | true |
| true | true | true | true |

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

EX-11

A or (A and B) = A

|  |  |  |
| --- | --- | --- |
| **A** | **B** | A or (A and B) |
| false | false | false |
| false | true | false |
| true | false | true |
| true | true | true |

A or (A and B) = A

EX-12

! ( !C and (!B or !C) ) = C

|  |  |  |
| --- | --- | --- |
| **B** | **C** | ! ( !C and (!B or !C) ) |
| false | false | false |
| false | true | true |
| true | false | false |
| true | true | true |

! ( !C and (!B or !C) ) = C

TABLE OF TRUTH

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

## EX-13

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

|  |  |  |
| --- | --- | --- |
| **a** | **b** | **(a == True and b == True) or (a == False and b == False)** |
| True | True | true |
| True | False | false |
| False | True | false |
| False | False | true |

The expression is equivalent to: