

TRABALHO DE RELAÇÕES LÓGICAS - CD

1 / 1

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1A) $(A \text{ and } B) = (B \text{ and } A) \rightarrow$ RELAÇÃO VÁLIDA $\rightarrow (S \text{ rox } S) \text{ rox } A \text{ (S)}$

A, B, IA and IB			A, B, IB and A		
T	T	T	T	T	T
T	F	F	F	T	F
F	T	F	F	T	F
F	F	F	F	F	F

$$1B) (A \text{ or } B) = (B \text{ or } A) \rightarrow \text{RELAÇÃO VÁLIDA}$$

A	B	I	A or B	A	B	I	B or A
T	T	I	(T)	T	T	I	(T)
T	F	I	T	T	I	F	T
F	T	I	T	F	I	T	T
F	F	I	F	F	F	I	F

1c) $(A \text{ xor } B) = (B \text{ xor } A) \rightarrow \text{RELAÇÃO VÁLIDA}$

A	B	$A \oplus B$	$A \oplus B$	A	B	$B \oplus A$
T	T	F	T	T	T	F
T	F	T	F	T	F	T
F	T	T	F	F	T	T
F	F	F	F	F	F	F

2A) $A \text{ and } (B \text{ and } C) = (A \text{ and } B) \text{ and } C \rightarrow \text{RELAÇÃO VÁLIDA}$

$$2B) A \text{ or } (B \text{ or } C) = (A \text{ or } B) \text{ or } C \rightarrow \text{RELAÇÃO VÁLIDA}$$

A	B	C	$B \text{ or } C$	$\text{or } A$		A	B	C	$A \text{ or } B$	$\text{or } C$
T	I	T	T	T		T	T	T	T	T
T	I	F	T	T		T	T	F	T	T
T	F	I	T	T		T	F	T	T	T
T	F	F	F	T		T	F	F	T	T
F	I	T	T	T	R	F	T	T	T	T
F	I	F	T	T		F	I	F	T	T
F	F	I	T	T		F	F	T	F	T
F	F	F	F	F		F	F	F	F	F

MARIANNA RIMES E MARCUS DUTRA

2c) $A \text{ xor } (B \text{ xor } C) = (A \text{ xor } B) \text{ xor } C \rightarrow \text{RELAÇÃO VÁLIDA}$

$A \mid B \mid C \mid B \text{ xor } C \mid \text{xor } A$	$A \mid B \mid C \mid A \text{ xor } B \mid \text{xor } C$
T T T F T	T T T T F
T T F T F	T T F F F
T F T T F	T F T T F
T F F F T	T F F F T
F T T F T	F T T T T
F T F T T	F T F T T
F F T T T	F F T F T
F F F F F	F F F F F

$(A \text{ xor } B) \text{ xor } C = (A \text{ xor } C) \text{ xor } B$

3a) $A \text{ and } (B \text{ and } c) = (C \text{ and } A) \text{ and } B \rightarrow \text{RELAÇÃO VÁLIDA}$

$A \mid B \mid C \mid B \text{ and } C \mid \text{and } A$	$A \mid B \mid C \mid C \text{ and } A \mid \text{and } B$
T T T T T	T T T T T
T T F F F	T T F F F
T F T F T	T F T T F
T F F F F	T F F F F
F T T T F	F T T T F
F T F F F	F T F F F
F F T F T	F F T F T
F F F F F	F F F F F

$(A \text{ and } C) \text{ and } B = (A \text{ and } B) \text{ and } C$

3b) $A \text{ or } (B \text{ or } C) = (C \text{ or } A) \text{ or } B \rightarrow \text{RELAÇÃO VÁLIDA}$

$A \mid B \mid C \mid B \text{ or } C \mid \text{or } A$	$A \mid B \mid C \mid C \text{ or } A \mid \text{or } B \text{ or } A$
T T T T T	T T T T T
T T F T F	T T F F F
T F T T T	T F T T T
T F F F T	T F F T T
F T T T T	F T T T T
F T F T F	F T F F T
F F T F T	F F T T F
F F F F F	F F F F F

$(A \text{ or } C) \text{ or } B = (A \text{ or } B) \text{ or } C$

3c) $A \text{ xor } (B \text{ xor } C) = (C \text{ xor } A) \text{ xor } B \rightarrow \text{RELAÇÃO VÁLIDA}$

$A \mid B \mid C \mid B \text{ xor } C \mid \text{xor } A$	$A \mid B \mid C \mid C \text{ xor } A \mid \text{xor } B \text{ or } A$
T T T F T	T T T T F
T T F T F	T T F F F
T F T F T	T F T T F
T F F F T	T F F F T
F T T F T	F T T T T
F T F T T	F T F F T
F F T T T	F F T F T
F F F F F	F F F F F

$(C \text{ xor } A) \text{ xor } B = (A \text{ xor } B) \text{ xor } C$

MARIANNA RIMES E MARCUS DUTRA

4A) $A \text{ and } (B \text{ or } C) \neq (A \text{ and } B) \text{ or } C \rightarrow \text{RELAÇÃO VÁLIDA}$

A	B	C	$B \text{ or } C$	$\text{and } A$	A	B	C	$A \text{ and } B$	$\text{or } C$
T	T	T	T	T	T	T	T	T	T
T	T	F	T	T	T	T	F	T	F
T	F	T	T	T	T	F	T	F	T
T	F	F	F	F	T	F	F	F	F
F	T	T	T	F	F	T	T	F	T
F	T	F	F	F	F	T	F	T	F
F	F	T	F	F	F	F	T	F	T
F	F	F	F	F	F	F	F	F	F

+ x

4B) $A \text{ or } (B \text{ and } C) \neq (A \text{ or } B) \text{ and } C \rightarrow \text{RELAÇÃO VÁLIDA}$

A	B	C	$B \text{ and } C$	$\text{or } A$	A	B	C	$A \text{ or } B$	$\text{and } C$
T	T	T	T	T	T	T	T	T	T
T	T	F	F	T	T	T	F	T	F
T	F	T	T	T	T	F	T	T	T
T	F	F	F	T	T	F	F	T	F
F	T	T	F	F	F	T	T	T	T
F	T	F	F	F	F	T	F	T	F
F	F	T	F	F	F	F	T	F	T
F	F	F	F	F	F	F	F	F	F

①

②

③

Algumas relações
da questões 5 estão
justificadas na questão
1.

5A) $\text{and } (A, B, C) : (A \text{ and } B) \text{ and } (C) = A \text{ and } (B \text{ and } C) \rightarrow \text{RELAÇÃO VÁLIDA}$

① $A \text{ and } B \text{ and } C$; ② $(A \text{ and } B) \text{ and } C$; ③ $A \text{ and } (B \text{ and } C)$

T		T		T
F		F		F
F		F		F
F		F		F
F		F		F
F		F		F

5B) $\text{or } (A, B, C) : (A \text{ or } B) \text{ or } C = A \text{ or } (B \text{ or } C) \rightarrow \text{RELAÇÃO VÁLIDA}$

① $A \text{ or } B \text{ or } C$; ② $(A \text{ or } B) \text{ or } C$; ③ $A \text{ or } (B \text{ or } C)$

T		T		T
T		T		T
T		T		T
T		T		T
F		F		F

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5c) $\text{nand}(A, B, C) : \text{not}(\text{and}(A, B, C)) = (\text{A nand B}) \text{nand C} = \text{A nand}(B \text{ nand C})$

$A \text{ nand } B \text{ and } C$

$A \text{ and } B \text{ and } C, \text{ not}$

A	B	C	$A \text{ nand } B$	$\text{nand } C$
T	T	T	F	T
T	T	F	F	F
T	F	T	T	F
T	F	F	T	T
F	T	T	T	F
F	T	F	T	T
F	F	T	T	F
F	F	F	T	T

A	$\text{and } B$	$\text{and } C$	not
T	T	T	F
F	T	F	T
F	F	T	T
F	F	F	T

$\text{not}(\text{and}(A, B, C)) = ! (A \text{ and } B \text{ and } C) \rightarrow \text{RELAÇÃO NÃO VÁLIDA}$

$(A \text{ nand } B) \text{ nand } C$

$A \text{ nand } (B \text{ nand } C)$

A	B	C	$A \text{ nand } B$	$\text{nand } C$
T	T	T	F	T
T	T	F	F	T
T	F	T	T	F
T	F	F	T	T
F	T	T	T	F
F	T	F	T	T
F	F	T	T	F
F	F	F	T	T

A	B	C	$B \text{ nand } C$	$\text{nand } A$
T	T	T	F	T
T	T	F	T	F
T	F	T	T	F
T	F	F	T	T
F	T	T	F	T
F	T	F	T	F
F	F	T	T	T
F	F	F	T	T

5d) $\text{nor}(A, B, C) : \text{not}(\text{or}(A, B, C)) = (\text{A nor B}) \text{ nor } C = \text{A nor } (\text{B nor C})$

$A \text{ nor } B \text{ nor } C$

$A \text{ or } B \text{ or } C, \text{ not}$

A	B	C	$A \text{ nor } B$	$\text{nor } C$
T	T	T	F	F
T	T	F	F	T
T	F	T	F	F
T	F	F	T	T
F	T	T	F	F
F	T	F	T	T
F	F	T	T	F
F	F	F	T	T

$\rightarrow \text{RELAÇÃO NÃO VÁLIDA}$

$(A \text{ nor } B) \text{ nor } C$

$A \text{ nor } (B \text{ nor } C)$

A	B	C	$A \text{ nor } B$	$\text{nor } C$
T	T	T	F	F
T	T	F	F	T
T	F	T	F	F
T	F	F	T	T
F	T	T	F	F
F	T	F	T	T
F	F	T	T	F
F	F	F	T	T

$A \text{ nor } (B \text{ nor } C), \text{ nor } A$

A	B	C	$B \text{ nor } C$	$\text{nor } A$
T	T	T	F	F
T	T	F	T	F
T	F	T	T	F
T	F	F	T	T
F	T	T	F	T
F	T	F	T	F
F	F	T	T	T
F	F	F	T	F

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$$5E) \text{ xor}(A, B, C) : (A \text{ xor } B) \text{ xor } C = A \text{ xor } (B \text{ xor } C)$$

$$A \text{ xor } B \text{ xor } C \mid (A \text{ xor } B) \text{ xor } C \mid A \text{ xor } (B \text{ xor } C)$$

T	T	T	T	T
F	F	F	F	F
F	T	T	T	F
T	F	F	F	T
F	T	T	T	F
T	F	T	T	F
T	F	F	F	T

\Rightarrow RELAÇÃO VÁLIDA