Atividades

1 - Complete as tabelas verdade para as seguintes expressões.

$(A + B)\ C$

$A \oplus (B \downarrow C)$

$(A \rightarrow B)\ (\neg C)$

A	B	C	A + B	(A + B) ∘ C
0	0	0	0	0
0	0	1	0	0
0	1	0	1	0
0	1	1	1	1
1	0	0	1	0
1	0	1	1	1
1	1	0	1	0
1	1	1	1	1

B ∘ C	A ⊕ (B ∘ C)	A → B	¬C	(A → B) ∘ (¬C)
0	0	1	1	1
0	0	1	0	0
0	0	1	1	1
1	1	1	0	0
0	1	0	1	0
0	1	0	0	0
0	1	1	1	1
1	0	1	0	0

2 - Prove se as expressões abaixo são equivalentes:

$(A + B) \cdot (A + C) = A + (B \cdot C)$

$A \leftrightarrow (B \oplus C) = (A \oplus B) \leftrightarrow C$

A	B	C	$(A + B) \cdot (A + C)$	$A + (B \cdot C)$	Equivalentes
0	0	0	0	0	Sim
0	0	1	0	0	Sim
0	1	0	0	0	Sim
0	1	1	1	1	Sim
1	0	0	1	1	Sim
1	0	1	1	1	Sim
1	1	0	1	1	Sim
1	1	1	1	1	Sim

$A \leftrightarrow (B \oplus C) = (A \oplus B) \leftrightarrow C$

$A \leftrightarrow (B \oplus C)$	$(A \oplus B) \leftrightarrow C$	Equivalentes
1	1	Sim
0	0	Sim
0	0	Sim
1	1	Sim
0	0	Sim
1	1	Sim
1	1	Sim
0	0	Sim

3 - Utilizando (https://circuitverse.org/simulator) crie circuitos lógico para representar as seguintes expressões:

$(A \uparrow B) + (\neg C)$

$(A \cdot B) + (\neg A \cdot C)$

$(A \oplus B) \cdot (C + D)$

$\neg (A + B) \cdot (C \downarrow D)$

$(A \rightarrow B) + (\neg C \rightarrow D)$

$(A + B + C) \cdot (A \uparrow D)$

A	B	C	D
0	0	0	0
0	0	0	1
0	0	1	0
0	0	1	1
0	1	0	0
0	1	0	1
0	1	1	0
0	1	1	1
1	0	0	0
1	0	0	1
1	0	1	0
1	0	1	1
1	1	0	0
1	1	0	1
1	1	1	0
1	1	1	1

$(A \uparrow B)$	$+ (\neg C)$	$=$
1	1	1
1	1	1
1	0	1
1	0	1
1	1	1
1	1	1
1	0	1
1	0	1
1	1	1
1	1	1
1	0	1
1	0	1
0	1	1
0	1	1
0	0	0
0	0	0

$(A \cdot B)$	$+ (\neg A \cdot C)$	$=$
0	0	0
0	0	0
0	1	1
0	1	1
0	0	0
0	0	0
0	1	1
0	1	1
0	0	0
0	0	0
0	0	0
0	0	0
1	0	1
1	0	1
1	0	1
1	0	1

$(A \oplus B)$	$\cdot (C + D)$	$=$
0	0	0
0	1	0
0	1	0
0	1	0
1	0	0
1	1	1
1	1	1
1	1	1
1	0	0
1	1	1
1	1	1
1	1	1
0	0	0
0	1	0
0	1	0
0	1	0

$\neg (A + B)$	$\cdot (C \downarrow D)$	$=$
1	1	1
1	0	0
1	0	0
1	0	0
0	1	0
0	0	0
0	0	0
0	0	0
0	1	0
0	0	0
0	0	0
0	0	0
0	1	0
0	0	0
0	0	0
0	0	0

$(A \rightarrow B) + (\neg C \rightarrow D) =$ $(A + B + C) \cdot (A \uparrow D) =$

1	1	1	0	1	0
1	1	1	0	1	0
1	0	1	1	1	1
1	1	1	1	1	1
1	1	1	1	1	1
1	1	1	1	1	1
1	0	1	1	1	1
1	1	1	1	1	1
0	1	1	1	1	1
0	1	1	1	0	0
0	0	0	1	1	1
0	1	1	1	0	0
1	1	1	1	1	1
1	1	1	1	0	0
1	0	1	1	1	1
1	1	1	1	0	0