**Exercice 1**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **F** | **G** | **F ↔ G** | **F → G** | **G → F** | **((F → G) ∧ (G → F))** |
| 0 | 0 | 1 | 1 | 1 | 1 |
| 0 | 1 | 0 | 1 | 0 | 0 |
| 1 | 0 | 0 | 0 | 1 | 0 |
| 1 | 1 | 1 | 1 | 1 | 1 |
| **(F ↔ G)  ≅  ((F → G) ∧ (G → F))** | | | | | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **F** | **G** | **￢F** | **F → G** | **￢F ∨ G** |
| 0 | 0 | 1 | 1 | 1 |
| 0 | 1 | 1 | 1 | 1 |
| 1 | 0 | 0 | 0 | 0 |
| 1 | 1 | 0 | 1 | 1 |
| **(F → G)  ≅  (￢F ∨ G)** | | | | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **F** | **G** | **H** | **G ∨ H** | **F ∧ G** | **F ∧ H** | **(F ∧ (G ∨ H))** | **((F ∧ G) ∨ (F ∧ H))** |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 |
| 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **(F ∧ (G ∨ H))  ≅  ((F ∧ G) ∨ (F ∧ H))** | | | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **F** | **G** | **￢F** | **￢G** | **F ∨ G** | **￢ (F ∨ G)** | **(￢F ∧ ￢G)** |
| 0 | 0 | 1 | 1 | 0 | 1 | 1 |
| 0 | 1 | 1 | 0 | 1 | 0 | 0 |
| 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| 1 | 1 | 0 | 0 | 1 | 0 | 0 |
| **(￢ (F ∨ G))  ≅  (￢F ∧ ￢G)** | | | | | | |

**Exercice 3**

**¬** CONCENTRER **→** BRUIT.

RECOMPENCE **→** QUELQU'UN **∧** MERITE.

GENS **∧** BRILLANTS **→** RECOMPENCE.

**Exercice 4**

Formule U(x), U(y), T(x), T(y).

Variable x, y.

(U(x) → U(y)) → T(x)

((U(x) → U(y)) → T(x)) → T(y)

∃x ∀y (((U(x) → U(y)) → T(x)) → T(y))

**Exercice 6**

Last (L, X) est vrai si X est le dernier élément de L:

Last ([\_|L], X) :- Last (L, X).

Convertir (L,N) :-

Convertir (L,0,N).

Convertir ([H|T], A, N) :-

!,

B is A\*10+H,

Convertir (T, B, N).

Convertir (\_, N, N).

Duplic (L, N, Copies) :-

length (Lists, N),

maplist (=(L), Lists),

append (Lists, Copies).

Color (vert).

Color (jaune).

Color (rouge).

Coloriage (C1, C2, C3, C4): -

Color (C1),

Color (C2),

Color (C3),

Color (C4),

C1\=C2, C1\=C3, C1\=C4, C2\=C3, C3\=C4.

Coloriage (C1, C2, C3, C4):

Color (C1),

Color (C2), C1\=C2,

Color (C3), C1\=C3, C2\=C3,

Color (C4), C1\=C4, C3\=C4.