Leonardo Faria Araujo Ciencias da computação

A) ~(p v ~q) → ((r ↔ s) v ~q)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| p | q | r | s | ~q | (p v ~q) | ~(p v ~q) | (r ↔ s) | ((r ↔ s) v ~q) | ~(p v ~q) → ((r ↔ s) v ~q) |
| v | v | v | v | f | v | f | v | v | v |
| v | v | v | f | f | v | f | f | f | v |
| v | v | f | v | f | v | f | f | f | v |
| v | v | f | f | f | v | f | v | v | v |
| v | f | v | v | v | v | f | v | v | v |
| v | f | v | f | v | v | f | f | v | v |
| v | f | f | v | v | v | f | f | v | v |
| v | f | f | f | v | v | f | v | v | v |
| f | v | v | v | f | v | f | v | v | v |
| f | v | v | f | f | v | f | f | f | v |
| f | v | f | v | f | v | f | f | f | v |
| f | v | f | f | f | v | f | v | v | v |
| f | f | v | v | v | f | v | v | v | v |
| f | f | v | f | v | f | v | f | v | v |
| f | f | f | v | v | f | v | f | v | v |
| f | f | f | f | v | f | v | f | v | v |

B) ~(r → ~q) → ((~p v ~r) ↔ ~s)

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| p | q | r | s | ~q | ~p | ~r | ~s | (r → ~q) | ~(r → ~q) | (~p v ~r) | ((~p v ~r) ↔ ~s) | ~(r → ~q) → ((~p v ~r) ↔ ~s) |
| v | v | v | v | f | f | f | f | f | v | f | v | v |
| v | v | v | f | f | f | f | v | f | v | f | f | f |
| v | v | f | v | f | f | v | f | v | f | v | f | v |
| v | v | f | f | f | f | v | v | v | f | v | v | v |
| v | f | v | v | v | f | f | f | v | f | f | v | v |
| v | f | v | f | v | f | f | v | v | f | f | f | v |
| v | f | f | v | v | f | v | f | v | f | v | f | v |
| v | f | f | f | v | f | v | v | v | f | v | v | v |
| f | v | v | v | f | v | f | f | f | v | v | f | f |
| f | v | v | f | f | v | f | v | f | v | v | v | v |
| f | v | f | v | f | v | v | f | v | f | v | f | v |
| f | v | f | f | f | v | v | v | v | f | v | v | v |
| f | f | v | v | v | v | f | f | v | f | v | f | v |
| f | f | v | f | v | v | f | v | v | f | v | v | v |
| f | f | f | v | v | v | v | f | v | f | v | f | v |
| f | f | f | f | v | v | v | v | v | f | v | v | v |

C) (p ^ ~q) ↔ (~(r → ~q) v (p ↔ s))

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| p | q | r | s | ~q | (p^~q) | (r → ~q) | ~(r → ~q) | (p ↔ s) | (~(r → ~q) v (p ↔ s)) | (p ^ ~q) ↔ (~(r → ~q) v (p ↔ s)) |
| v | v | v | v | f | f | f | v | v | v | f |
| v | v | v | f | f | f | f | v | f | v | f |
| v | v | f | v | f | f | v | f | v | v | f |
| v | v | f | f | f | f | v | f | f | f | v |
| v | f | v | v | v | v | v | f | v | v | v |
| v | f | v | f | v | v | v | f | f | f | f |
| v | f | f | v | v | v | v | f | v | v | v |
| v | f | f | f | v | v | v | f | f | f | f |
| f | v | v | v | f | f | f | v | f | v | f |
| f | v | v | f | f | f | f | v | v | v | f |
| f | v | f | v | f | f | v | f | f | f | v |
| f | v | f | f | f | f | v | f | v | v | f |
| f | f | v | v | v | f | v | f | f | f | v |
| f | f | v | f | v | f | v | f | v | v | f |
| f | f | f | v | v | f | v | f | f | f | v |
| f | f | f | f | v | f | v | f | v | v | f |

D) ~(p → q) v ((~p → ~r) v (~q ↔ s))

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| p | q | r | s | ~p | ~q | ~r | (p → q) | ~(p → q) | ((~p → ~r) | (~q ↔ s) | ((~p → ~r) v (~q ↔ s)) | ~(p → q) v ((~p → ~r) v (~q ↔ s)) |
| v | v | v | v | f | f | f | v | f | v | f | v | v |
| v | v | v | f | f | f | f | v | f | v | v | v | v |
| v | v | f | v | f | f | v | v | f | v | f | v | v |
| v | v | f | f | f | f | v | v | f | v | v | v | v |
| v | f | v | v | f | v | f | f | v | v | v | v | v |
| v | f | v | f | f | v | f | f | v | v | f | v | v |
| v | f | f | v | f | v | v | f | v | v | v | v | v |
| v | f | f | f | f | v | v | f | v | v | f | v | v |
| f | v | v | v | v | f | f | v | f | f | f | f | f |
| f | v | v | f | v | f | f | v | f | f | v | v | v |
| f | v | f | v | v | f | v | v | f | v | f | v | v |
| f | v | f | f | v | f | v | v | f | v | v | v | v |
| f | f | v | v | v | v | f | v | f | f | v | v | v |
| f | f | v | f | v | v | f | v | f | f | f | f | f |
| f | f | f | v | v | v | v | v | f | v | v | v | v |
| f | f | f | f | v | v | v | v | f | v | f | v | v |

**~(p → q) v ((~p → ~r) v (~q ↔ s)) - TABELA CONTRADITÓRIA**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| p | q | r | s | ~p | ~q | ~r | (p → q) | ~(p → q) | ((~p → ~r) | (~q ↔ s) | ((~p → ~r) v (~q ↔ s)) | ~(p → q) v ((~p → ~r) v (~q ↔ s)) |
| v | v | v | v | f | f | f | v | f | v | f | v | F |
| v | v | v | f | f | f | f | v | f | v | v | v | F |
| v | v | f | v | f | f | v | v | f | v | f | v | F |
| v | v | f | f | f | f | v | v | f | v | v | v | F |
| v | f | v | v | f | v | f | f | v | v | v | v | F |
| v | f | v | f | f | v | f | f | v | v | f | v | F |
| v | f | f | v | f | v | v | f | v | v | v | v | F |
| v | f | f | f | f | v | v | f | v | v | f | v | F |
| f | v | v | v | v | f | f | v | f | f | f | f | F |
| f | v | v | f | v | f | f | v | f | f | v | v | F |
| f | v | f | v | v | f | v | v | f | v | f | v | F |
| f | v | f | f | v | f | v | v | f | v | v | v | F |
| f | f | v | v | v | v | f | v | f | f | v | v | F |
| f | f | v | f | v | v | f | v | f | f | f | f | F |
| f | f | f | v | v | v | v | v | f | v | v | v | F |
| f | f | f | f | v | v | v | v | f | v | f | v | F |

**~(r → ~q) → ((~p v ~r) ↔ ~s) - TABELA TAUTOLÓGICA**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| p | q | r | s | ~q | ~p | ~r | ~s | (r → ~q) | ~(r → ~q) | (~p v ~r) | ((~p v ~r) ↔ ~s) | ~(r → ~q) → ((~p v ~r) ↔ ~s) |
| v | v | v | v | f | f | f | f | f | v | f | v | V |
| v | v | v | f | f | f | f | v | f | v | f | f | V |
| v | v | f | v | f | f | v | f | v | f | v | f | V |
| v | v | f | f | f | f | v | v | v | f | v | v | V |
| v | f | v | v | v | f | f | f | v | f | f | v | V |
| v | f | v | f | v | f | f | v | v | f | f | f | V |
| v | f | f | v | v | f | v | f | v | f | v | f | V |
| v | f | f | f | v | f | v | v | v | f | v | v | V |
| f | v | v | v | f | v | f | f | f | v | v | f | V |
| f | v | v | f | f | v | f | v | f | v | v | v | V |
| f | v | f | v | f | v | v | f | v | f | v | f | V |
| f | v | f | f | f | v | v | v | v | f | v | v | V |
| f | f | v | v | v | v | f | f | v | f | v | f | V |
| f | f | v | f | v | v | f | v | v | f | v | v | V |
| f | f | f | v | v | v | v | f | v | f | v | f | V |
| f | f | f | f | v | v | v | v | v | f | v | v | V |