**Tautologie und Kontradiktion**

**1.**

|  |  |  |  |
| --- | --- | --- | --- |
| a) | A | **A → A** |  |
|  | w | w |  |
|  | f | w | Tautologie |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| b) | A | ¬A | **A → ¬A** |  |
|  | w | f | f |  |
|  | f | w | w |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| c) | A | ¬A | **A ↔ ¬A** |  |
|  | w | f | f |  |
|  | f | w | f | Kontradiktion |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| d) | A | B | ¬A | ¬B | (¬A) ∨ (¬B) | **¬((¬A) ∨ (¬B))** |
|  | w | w | f | f | f | w |
|  | w | f | f | w | w | f |
|  | f | w | w | f | w | f |
|  | f | f | w | w | w | f |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| e) | A | B | A ∨ B | ¬A | ¬B | (¬A) ∧ (¬B) | **(A ∨ B) ∨ ((¬A) ∧ (¬B))** |
|  | w | w | w | f | f | f | w |
|  | w | f | w | f | w | f | w |
|  | f | w | w | w | f | f | w |
|  | f | f | f | w | w | w | w |

 Tautologie

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| f) | A | B | A ∧ B | ¬A | ¬B | (¬A) ∧ (¬B) | **(A ∧ B) ∨ ((¬A) ∧ (¬B))** |
|  | w | w | w | f | f | f | w |
|  | w | f | f | f | w | f | f |
|  | f | w | f | w | f | f | f |
|  | f | f | f | w | w | w | w |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| g) | A | B | A ∧ B | ¬A | **(A ∧ B) ∧ (¬A)** |  |
|  | w | w | w | f | f |  |
|  | w | f | f | f | f |  |
|  | f | w | f | w | f |  |
|  | f | f | f | w | f | Kontradiktion |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| h) | A | B | A → B | ¬A | (A → B) ∧ (¬A) | **((A → B) ∧ (¬A)) ∧ B** |
|  | w | w | w | f | f | f |
|  | w | f | f | f | f | f |
|  | f | w | w | w | w | w |
|  | f | f | w | w | w | f |

 Kontradiktion

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| i) | A | B | A → B | B → A | **(A → B) ∨ (B → A)** |  |
|  | w | w | w | w | w |  |
|  | w | f | f | w | w |  |
|  | f | w | w | f | w |  |
|  | f | f | w | w | w | Tautologie |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| i) | A | B | A → B | A ∧ (A → B) | **(A ∧ (A → B)) → B** |  |
|  | w | w | w | w | w |  |
|  | w | f | f | f | w |  |
|  | f | w | w | f | w |  |
|  | f | f | w | f | w | Tautologie |

**2.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| a) | A | B | A → B | (¬B) → (¬A) | **(A → B) ↔ ((¬B) → (¬A))** |  |
|  | w | w | w | w | w |  |
|  | w | f | f | f | w |  |
|  | f | w | w | w | w |  |
|  | f | f | w | w | w | Tautologie |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| b) | A | B | C | B → C | A → (B → C) | A ∧ B | (A ∧ B) → C | **(A → (B → C)) ↔ ((A ∧ B) → C)** |
|  | w | w | w | w | w | w | w | w |
|  | w | w | f | f | f | w | f | w |
|  | w | f | w | w | w | f | w | w |
|  | w | f | f | w | w | f | w | w |
|  | f | w | w | w | w | f | w | w |
|  | f | w | f | f | w | f | w | w |
|  | f | f | w | w | w | f | w | w |
|  | f | f | f | w | w | f | w | w |

 Tautologie