**Verknüpfungen von Aussagen mit ¬, ∧, ∨**

**1.**

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

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| b) | 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 |

**2.**

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

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

c) Die fünfte und die letzte Spalte sind jeweils identisch. Das heißt (¬A) ∧ (¬B) und ¬ (A ∨ B) sind logisch äquivalent und genauso (¬A) ∨ (¬B) und ¬ (A ∧ B) (De Morgan’sche Gesetze).

**3.**

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

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

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

d) Die Aussage aus b).