Homework 1

* 1. It is not the case that I bought a lottery ticket this week.
  2. I bought the lottery ticket this week or I won the million-dollar jackpot.
  3. If I bought a lottery ticket this week, then I won the million-dollar jackpot
  4. I bought a lottery ticket this week and I won the million-dollar jackpot.
  5. I bought a lottery ticket this week if an only if I won the million-dollar jackpot.
  6. If it is not the case that I bought the lottery ticket this week, then it is not the case that I won the million-dollar jackpot.
  7. It is not the case that I bought a lottery ticket this week and it is not the case that I won the million-dollar jackpot.
  8. It is not the case that I bought a lottery ticket this week or I bought a lottery ticket this week and I won the million-dollar jackpot.
  9. True
  10. False
  11. True
  12. False
  13. True
  14. True
  15. False
  16. True

a.

|  |  |  |
| --- | --- | --- |
| p | ¬p | p →¬p |
| T | F | F |
| F | T | T |

b.

|  |  |  |
| --- | --- | --- |
| p | ¬p | p ↔¬p |
| T | F | F |
| F | T | F |

c.

|  |  |  |  |
| --- | --- | --- | --- |
| p | q | p ∨ q | p ⊕ ( p ∨ q ) |
| T | T | T | F |
| T | F | T | F |
| F | T | T | T |
| F | F | F | F |

d.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| p | q | p ∧ q | p ∨ q | ( p ∧ q ) → ( p ∨ q ) |
| T | T | T | T | T |
| T | F | F | T | T |
| F | T | F | T | T |
| F | F | F | F | T |

e.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| p | q | ¬p | q → ¬p | p ↔ q | ( q → ¬p ) ↔ ( p ↔ q ) |
| T | T | F | F | T | F |
| T | F | F | T | F | F |
| F | T | T | T | F | F |
| F | F | T | T | T | T |

f.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| p | q | ¬q | p ↔ q | p ↔ ¬q | ( p ↔ q ) ⊕ ( p ↔ ¬q ) |
| T | T | F | T | F | T |
| T | F | T | F | T | T |
| F | T | F | F | T | T |
| F | F | T | T | F | T |