# Homework 3

Christopher Achenbach

## Truth Table Problem

| $p$ | $r$ | $\sim p$ | $p \wedge (\sim p)$ | $(\sim p) \vee r$ | $(p \wedge (\sim p)) \vee r$ | $p \wedge ((\sim p) \vee r)$ |
|---|---|---|---|---|---|---|
| 1 | 1 | 0 | 0 | 1 | 1 | 1 |
| 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 0 | 1 | 1 | 0 | 1 | 1 | 1 |
| 0 | 0 | 1 | 0 | 1 | 0 | 1 |

Thus, $(p \wedge (\sim p)) \vee r \not\equiv p \wedge ((\sim p) \vee r)$.

## Problems from 2.2

1. $p$: The number 8 is even.
   $q$: The number 8 is a power of 2.
   $p \wedge q$.

2. $p$: The matrix is invertible.
   $\sim p$.

3. $p$: $x = y$
   $\sim p$.

8. $p$: x = 0.
   $q$: y = 0.
   $p \vee q$.

9. $p$: $x \in A$.
   $q$: $x \notin B$.
   $p \wedge q$.

10. $p$: $x \in A$.
    $q$: $x \in B$.
    $p \vee q$.

14. $p$: A man should look for what it is.
    $q$. A man should look for what he thinks it should be.
    $p \wedge \sim q$.