AE1MCS: Tutorial 1

- Show that $(p \rightarrow r) \vee (q \rightarrow r)$and $(p \wedge q) \rightarrow r$ are logically equivalent

- Show that $\neg p \rightarrow (q \rightarrow r)$ and $q \rightarrow (p \vee r)$ are logically equivalent

- Show that $(p \rightarrow q) \rightarrow r$ and $p \rightarrow (q \rightarrow r)$ are ***not*** equivalent

Use truth tables to verify each tautology

1. $\big(p \to (q \vee r)\big) \leftrightarrow \big((p \wedge \neg q) \to r\big)$

2. $\big(p \to (q \to r)\big) \leftrightarrow \big((p \wedge q) \to r\big)$

Let $P(x), Q(x)$, and $R(x)$ be the statements "x is a professor," "x is ignorant," and "x is vain," respectively. Express each of these statements using quantifiers; logical connectives; and $P(x), Q(x)$, and $R(x)$, where the domain consists of all people.

a) No professors are ignorant.
b) All ignorant people are vain.
c) No professors are vain.
d) Does (c) follow from (a) and (b)?

More Exercises in the Textbook

- Section 1.4
  - 7-10, 43, 44, 46-51, 59-62
- Section 1.5
  - 3, 4, 7-9, 14-17, 29-32