

## Problem Set 2

Due by **class time on Tuesday December 1st via email (kevinpatton@unomaha.edu)**. Lateness penalties (10% reduction per day) will apply to submissions after that time, unless you supply documentation of an illness or family emergency.

**You may not discuss these questions with anyone else. The work you submit must be your own.**

### Proofs:

Do the following proofs using the following rules **ONLY**: Conjunction, Simplification, Modus Ponens, Disjunctive Syllogism, Addition, Modus Tollens, Hypothetical Syllogism, and Constructive Dilemma. 10 pts each.

- a.  $(B \vee F) \supset (A \supset G), (B \vee E) \supset (G \supset K), B \cdot \sim H \vdash A \supset K$
- b.  $(\sim A \vee D) \supset (B \supset F), (B \vee C) \supset (A \supset E), A \vee B, \sim A \vdash E \vee F$
- c.  $(\sim S \vee B) \supset (S \vee K), (K \vee \sim D) \supset (H \supset S), \sim S \cdot W \vdash \sim H$

### Proofs

Do the following proofs using the following rules **ONLY**: Conjunction, Simplification, Modus Ponens, Disjunctive Syllogism, Addition, Modus Tollens, Hypothetical Syllogism, Constructive Dilemma, Commutation, Association, Double Negation, Material Implication, and De Morgan's. 10 pts each.

- d.  $\sim(A \cdot B), \sim\sim A \vdash \sim B$
- e.  $A \supset B \vdash \sim B \supset \sim A$
- f.  $A \supset (B \supset C) \vdash (A \cdot B) \supset C$

### Proofs

Do the following proofs using all 18 rules. 20 pts each.

- g.  $N \supset O, N \supset P \vdash N \supset (O \cdot P)$
- h.  $(E \vee F) \supset (C \cdot D), (D \vee G) \supset H, E \vee G \vdash H$