Homework 3

SUBJECT: Dennis George Part 1 Proof
DATE: / /

Φ_1 p3...p5 → wantp = 1
Φ_2 wantp = 1 → p3...p5
Φ_3 p3...p5 ↔ wantp = 1 and
q3...q5 ↔ wantq = -1
Φ_4 ¬(p4 ∧ q4)

Proof of Φ_1

Φ_1 p3...p5 → wantp = 1

Base Case
p3...p5 is false, so Φ_1 is true

Inductive Step
1. q doesn't matter because it doesn't change p
2. p1 → p2 doesn't change Φ_1
3. p2 → p3 p3...p5 is true and wantp = 1 is true T → T
4. p3 → p4 doesn't change wantp. Still true
5. p4 → p5 doesn't change wantp. Still true
6. p5 → p1 p3...p5 becomes false Φ_1 is true

Therefore Φ_1 is true