

Problem Set 2 (for Lectures 3 and 4) Solutions

April 8, 2017

- A1. This is equivalent to saying: For $n \in \mathbb{N}$, $6|n \implies \text{condition}$.
- (a) TRUE. ($6|n \implies 3|n$)
 - (b) FALSE. ($\neg[6|n \implies 9|n]$)
 - (c) FALSE. ($\neg[6|n \implies 12|n]$)
 - (d) FALSE. ($\neg[6|n \implies (n = 24)]$)
 - (e) TRUE. ($6|n \implies 3|n^2$)
 - (f) TRUE ($6|n \implies (n = 2k) \wedge 3|n$)
- A2. This is equivalent to saying: For $n \in \mathbb{N}$, $\text{condition} \implies 6|n$.
- (a) FALSE. ($\neg[3|n \implies 6|n]$)
 - (b) FALSE. ($\neg[9|n \implies 6|n]$)
 - (c) TRUE. ($12|n \implies 6|n$)
 - (d) TRUE. ($(n = 24) \implies 6|n$)
 - (e) FALSE. ($\neg[3|n^2 \implies 6|n]$)
 - (f) TRUE. ($(n = 2k) \wedge 3|n \implies 6|n$)
- A3.
- (a) FALSE
 - (b) FALSE
 - (c) FALSE
 - (d) FALSE
 - (e) FALSE
 - (f) TRUE
- A4. THE APPLES ARE RED
- A5. f IS DIFFERENTIABLE
- A6. f IS INTEGRABLE

- A7. S IS CONVERGENT
- A8. $2^n - 1$ IS PRIME
- A9. THE TEAM WINS
- A10. KARL IS PLAYING
- A11. KARL IS PLAYING
- A12. FALSE. (Proved in Assignment 4, A10)
- A13. TRUE. (Proved in Assignment 4, A9)
- A14.
 - (a) Equivalent
 - (b) Equivalent
 - (c) Not Equivalent
 - (d) Equivalent
 - (e) Equivalent. (from $[P \implies (Q \wedge R)] \iff [(P \implies Q) \wedge (P \implies R)]$)
 - (f) Equivalent
- A15. 18 pts. Logical Correctness (2 pts) + Clarity (4 pts) + Opening (4 pts) + Stating the conclusion (4 pts) + Reasons (2 pts) + Overall valuation (2 pts)