

CSE - 015: Homework 3

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1 Knights and Knaves

- One day a traveller was wandering around the island of Knights and Knaves, when he encountered two local inhabitants, P and Q. The traveller asked: “Is any of you a knave?”. P replied: “At least one of us is a knave”.
 - Can you find out what P and Q are? If so, what are they? If not, explain why not, and what other information you would need to know.
 - Answer:
- Later on, the traveller met two other locals, A and B. He asked whether either of them is a knight. A replied: “If B is a knave, then I am a knave too”.
 - What are A and B?
 - Answer:

2 Logical Identities

- $\neg(p \rightarrow (q \rightarrow p))$
 - Answer:
- $\neg p((p \wedge q) \rightarrow (q \vee p))$
 - Answer:

3 Logical Equivalences

- $p \rightarrow (q \rightarrow r)$ and $(p \wedge q) \rightarrow r$
 - Answer:
- $p \rightarrow (q \rightarrow r)$ and $(p \rightarrow q) \rightarrow r$
 - Answer:

4 Logical Consequence

- Jimmy is smart Smart People are rich Jimmy is Rich _____
- Islands are surrounded by water Puerto Rico is surrounded by water Puerto Rico is an island _____

Here is some text before by aligned text

- Islands are surrounded by water
- Puerto Rico is surrounded by water _____
- Puerto Rico is an island