

## **General comments on Problem Set 1:**

Each question in parts 1 and 2 is graded out of 4:

- 1: you got the right answer (“valid,” “invalid,” “true,” or “false”) but either made no attempt to explain your answer, or gave a wrong explanation, or merely restated the question as your explanation.
- 2: You got the right answer and made some intelligible attempt to explain it.
- 3: You got the right answer and your explanation showed that you sort of understood what was going on.
- 4: You got the right answer and clearly understood what was going on. [A 4 does not mean that your explanation contained no errors].

“P follows from Q” does NOT mean the same as “If Q then P.” Many of you thought it did. “If I was born in Scotland then I was born in the United Kingdom” is true; but “I was born in the United Kingdom” does not follow (as a matter of logic) from “I was born in Scotland.” Also, “P follows from Q” does not mean “Q caused P.”

Some people thought “valid argument” means “not the case that premises are true and conclusion false”; likewise, some thought that a consistent set was a set whose sentences are all true. But they don’t mean that: a valid argument is one which CANNOT (as a matter of logic) have true premises and a false conclusion, not merely one which DOES NOT have true premises and a false conclusion. Likewise a consistent set is a set whose sentences, taken together, can all be true.

[Why “taken together”? The sentences in the set {grass is green, grass is not green} can each be true “taken separately”; that is, “grass is green” can be true and “grass is not green” can be true. But they cannot all be true together: It cannot be true both that grass is green and that grass is not green.]

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## **Canonical Counterexamples:**

1a. If Jones is in New York, Jones is in the USA. Jones is not in New York. Therefore, Jones is not in the USA.

1d. Bill Clinton is not George Bush. George Bush is not the winner of the 1996 election. Therefore, Bill Clinton is not the winner of the 1996 election.

1f. It is possible that grass is green. It is possible that grass is not green. Therefore, it is possible that grass is green and not green.

2a. “Jones is in New York” doesn’t follow from “Jones is in the USA,” but “Jones is not in New York” doesn’t follow from “Jones is in the USA” either.

2b. “Roger is not 6 feet tall” does not follow from “Roger is 6 feet tall and George lives in Canada,” but “Roger is 6 feet tall” does follow from “Roger is 6 feet tall and George lives in Canada.”

2c. “Roger is 6 feet tall” follows from “Roger is 6 feet tall and George lives in Canada,” but “Roger is not 6 feet tall” does not follow from “Either Roger is not 6 feet tall or George does not live in Canada.”

[NB: the denial of a sentence of the form “P and Q” is not “not P and not Q,” as some people thought, but instead “not P or not Q.”]

2f. {Grass is green, Grass is not green.} (I discussed this above).

2i. Anne lives in Brooklyn. Anne does not live in Brooklyn. Therefore, George Bush is President.

2j. “Someone won the lottery” follows from “Adam won the lottery”; but “If someone won the lottery, Adam won the lottery” is not logically true.

2k. {Grass is green, Grass is not green, Snow is white} and {Grass is green, Grass is not green, Snow is not white} are both inconsistent.

3d. The added premise needed is “Necessarily, the world is not as perfect as it could possibly be.”

4. (worth 12 points)

1. If God exists, God is omnipotent and perfectly good.
2. If a being is omnipotent then he can prevent natural evil.
3. If a being is perfectly good and he can prevent natural evil then no natural evil occurs.
4. Natural evil occurs.
5. Therefore, God does not exist.

Premise 4 did not occur in the paragraph. Premises about earthquakes and hurricanes and pain and suffering were not needed.