Answers to Exercises 2

Which of the following claims are true, which false, and why?

1 *If someone produces an invalid argument, his premisses and conclusion must make a logically inconsistent set.*

Not so: consider

Premiss: Socrates was a philosopher
Conclusion: Socrates had a snub nose

That's plainly invalid as an argument. The premiss and the conclusion are consistent with each other (both true, in fact).

2 *If an argument has false premisses and a true conclusion, then the truth of the conclusion can't really be owed to the premisses: so the argument is not a valid one.*

False. The argument 'Socrates is a woman; all women are philosophers; hence Socrates is a philosopher' is a *valid* argument with false premisses and a true conclusion. To be sure, what makes it the case that Socrates is a philosopher in the actual world is not his being a woman and all women being philosophers. But that just goes to show that a proposition can be such that (1) if certain other propositions were true, it would have to be true too, but (2) still happen to be true even if those other propositions are false.

3 *Any inference with true premisses and a true conclusion must be truth-preserving and so valid.*

False again. What is required for validity is an inference's being *necessarily* truth-preserving. 'Socrates is a man; hence England has a queen' has true premiss and true conclusion but is not necessarily truth-preserving! We can imagine a possible world where Socrates is still a man but England has become a republic.

4 *If the conclusion of an argument is false and all its premisses are true, then the argument cannot be deductively valid.*

True!—it's the invadility principle again!

5 *You can make a valid argument invalid by adding extra premisses.*

False! If there is no way that *A* can be true and *C* false (so the argument '*A*, so *C*' is valid), then there is no way that *A* can be true along with *B* as well, and *C* false (so the argument '*A*, *B* so *C*' will be valid too). The added premisses may be redundant. But adding redundancy doesn't wreck the property of truth-preservation.

6 *You can make a sound inference unsound by adding extra premisses.*

Yes: just add a false premiss and the argument won't be sound.

7 *You can make an invalid argument valid by adding extra premisses.*

True. Plainly we can do it sometimes: 'Socrates is a woman; hence Socrates is a philosopher' is invalid. 'Socrates is a woman; all women are philosophers; hence Socrates is a philosopher' is valid. Can you *always* do it? Yes! Just add the conclusion as a new premiss, and the argument will be trivially valid!

8 *If a set of propositions is consistent, then adding a further true proposition to it can't make it inconsistent.*

False! The set of propositions {Socrates is a woman. No women are philosophers} is consistent. Add the truth that Socrates is a philosopher, and we get the *in*consistent set {Socrates is a woman. No women are philosophers. Socrates is a philosopher}. Propositions can be consistent with each other but false!

9. *If a set of true propositions is consistent, then adding a further false proposition to it must make it inconsistent.*

No. The propositions in the set {Socrates is a man. All men are mortal} are true and therefore consistent (did you notice the oddity of that 'if' in the question?). Add the falsity that Socrates died of old age and we still have a consistent set of sentences {Socrates is a man. All men are mortal. Socrates died of old age} – consistent because they *could* have been true together.

10. *If a set of propositions is inconsistent, then if we remove some proposition P, we can validly infer that P is false from the remaining propositions in the set.*

True. Suppose some set *S* of propositions *plus P* is inconsistent. That means there is no way of making those propositions in *S* true and making *P* true too. That means that any way of making the propositions in *S* true must make *P false*. Which is to say that we can validly infer that *P* is false from the propositions in *S*.