CAP4630: Propositional Logic Practice Problems

1. Use resolution refutation for propositional logic to prove the conclusions of the following arguments:

a.
I have a book or I have a pencil.
If I have a pencil, then I can write.
I have a book, and I cannot write.
Therefore, I don't have a pencil.

b.
I have a car, and it is not raining.
If I have a car, then either I have to clean it or I have to wax it.
I do not clean my car.
Therefore, I have to wax it.

c.
If Jack is out of town or Michael is playing video games, then it is summer.
If it is summer, then either Jack is not out of town or Andrew is studying.
Jack is out of town or Michael is playing video games, and Andrew is not studying.
Therefore, it is summer.

d.
Justin wears jeans or Jasmine wears a jacket, and Justin doesn't wear jeans or Victor wears a shirt.
If Justin doesn't wear jeans and Jasmine doesn't wear a jacket, then Victor doesn't wear a shirt and George wears glasses.
If George wears glasses, then Justin doesn't wear jeans and Jasmine doesn't wear a jacket.
George wears glasses.
Therefore, Jasmine wears a jacket.

e.
I have a Math exam or I have a Biology exam.
If I have a Math exam, then I don't go out.
If I have a Biology exam and weather is good, then I study outside.
Weather is good, I don't have a Math exam and I go out.
Therefore, I study outside.