For 1 – 8, determine if the argument is deductively valid or invalid. If it is valid, determine which one of the rules listed in section A.1 it uses. (If it is valid, it uses one of those rules.)

(1) [P1] George is fast, and Sam is slow.
[C] Therefore, Sam is slow.

(2) [P1] Either today is Labor Day, or the building is full.
[P2] The building isn't full.
[C] Therefore, today is Labor Day.

(3) [P1] If the green van is missing, then Claire is at the beach.
[P2] The green van is missing.
[C] Therefore, Claire is at the beach.

(4) [P1] Jeff is playing basketball, or Mary is watching television.
[P2] Mary is watching television.
[C] Therefore, Jeff is playing basketball.

(5) [P1] Amy is on campus.
[C] Therefore, Amy is on campus, or she is on the moon.

(6) [P1] Sam is in the restaurant.
[P2] Kate is in the library.
[C] Therefore, Sam is in the restaurant, and Kate is in the library.

(7) [P1] If Roger is in the bank, then Steven is waiting in the apartment.
[P2] Roger is not in the bank.
[C] Therefore, Steven is not waiting in the apartment.

(8) [P1] If Joan is at work, then Kate is sleeping.
[C] Therefore, if Kate is not sleeping, then Joan is not at work.

For 9 – 12, complete the argument using the rule that is given. In some cases, you may have to supply an additional sentence.

(9) Use modus tollens.
[P1] … . [P2] Amy is not in the library. [C] Therefore, today is not Monday.

(10) Use disjunction-elimination.
[P1] … . [P2] It isn't raining. [C] Therefore, Jeff is fishing.

(11) Use the hypothetical syllogism.
[P1] If Eric is fixing his car, then George is in Ohio. … [C] If Eric is fixing his car, then Lisa is at the meeting.

(12) Use conjunction-elimination.
… [C] George was born in Virginia.