7.7 Practice Questions: Valid and Invalid Argument Forms

Translate and symbolize the following arguments. Identify what kind of argument form(s) each argument contains and whether or not the argument is valid as a result.

1. Either Sally will come to party or Jason will come to the party, but not both (because they hate each other). Jason said he won't come to the party, so Sally must be coming to the party.

   P = Sally will come to the party.
   Q = Jason will come to the party.

   1. P v Q
   2. –Q
   3. ∴ P

   This argument consists of a disjunctive syllogism, which is a valid argument form. The argument is valid as a result.

2. Whenever it rains my roof leaks, and every time my roof leaks my carpet gets wet. So every time it rains my carpet gets wet.

   P = It is raining.
   Q = My roof leaks.
   R = My carpet gets wet.

   1. P → Q
   2. Q → R
   3. ∴ P → R

   This argument consists of a hypothetical syllogism, which is a valid argument form. As a result, this argument is valid.

3. If Karl wrote a logic text, he must be a very cool person. But Karl is not a very cool person, so he must not have written a logic text.

   P = Karl wrote a logic text.
   Q = Karl is a very cool person.

   1. P → Q
   2. –Q
   3. ∴ –P

   This argument consists of a *modus tollens*, which is a valid argument form. As a result, this argument is valid (even though we know the premises and conclusion to be false!).

4. If Neta proofreads a friend's writing, then she must be a good friend. Neta did proofread a friend's writing, so she must be a good friend.

   P = Neta proofreads a friend's writing.
   Q = Neta is a good friend.

   1. P → Q
   2. P
   3. ∴ Q

   This argument consists of a *modus ponens*, a valid argument form. As a result, this argument is valid.

5. When Ruthann plays video games she has fun. And when Ruthann is having fun she is happy. So, Ruthann is happy when she plays video games.

   P = Ruthann plays video games.
   Q = Ruthann has fun.
   R = Ruthann is happy.

   1. P → Q
   2. Q → R
   3. ∴ P → R

   This argument consists of a hypothetical syllogism, which is a valid argument form. As a result, this is a valid argument.

6. If Xi wins the race, then he must be a fast runner. Xi didn't win the race, so he must be slow.

   P = Xi wins the race.
   Q = Xi is a fast runner.

   1. P → Q
   2. –P
   3. ∴ –Q

   This argument denies the antecedent, which is an invalid argument form. As a result, this argument is invalid.

7. Whenever it rains I take my umbrella with me. I have my umbrella, so it must be raining.

   P = It is raining.
   Q = I take my umbrella with me.

   1. P → Q
   2. Q
   3. ∴ P

   This argument affirms the consequent, an invalid argument form. As a result, this argument is invalid.

8. Either Shelly or Jim will get the job, and if Jim gets the job then I will get a raise. Shelly didn't get the job, so I'll get a raise.

   P = Shelly gets the job.
   Q = Jim gets the job.
   R = I get a raise.

   1. P v Q
   2. Q → R
   3. –P
   4. ∴ R

   This argument contains two valid argument forms: a disjunction syllogism and a *modus ponens*. Because both argument forms are valid, the argument is valid.

9. When people annoy Jennifer, she gets either angry or quiet. Jennifer is angry, so people must be annoying her.

   P = People annoy Jennifer.
   Q = Jennifer is angry.
   R = Jennifer is quiet.

   1. P → (Q v R)
   2. Q
   3. ∴ P

   This argument affirms the consequent, an invalid argument form. As a result, this is an invalid argument. (Note: although the consequent is a disjunction, this argument does not contain a disjunctive syllogism.)

10. Either Alex vacationed in Paris or Vancouver last summer. If he vacationed in Paris he must have seen the Eiffel Tower, but he hasn't seen it, so he must have been in Vancouver.

    P = Alex vacationed in Paris.
    Q = Alex vacationed in Vancouver.
    R = Alex saw the Eiffel Tower.

    1. P v Q
    2. P → R
    3. –R
    4. –P (from a *modus tollens* in lines 2 and 3)
    5. ∴ Q (from a disjunctive syllogism in lines 1 and 4)

    You probably had a hard time writing out this argument, even though you can see what argument forms it contains. Chapter 7 will explain how to properly write out reasoning of this sort.

    This argument contains two argument forms. First, it denies the consequent, which is a valid argument form. It then contains a disjunctive syllogism, which is a valid argument form. Because it contains valid argument forms, it is a valid argument.