

Tutorial A04 Answer Key

A04.1 Exercises

Question 1. Is it possible to have arguments of the following kinds? If so, provide an example. If not, explain why. It is particularly important to note the highlighted cases.

Answer: Examples will vary. See sample examples below.

	True conclusion true premises	True conclusion false premises	False conclusion true premises	False conclusion false premises
Valid & sound	Yes. "Cows are mammals. Mammals are animals. So cows are animals."	No. If the premises are false, then the argument is not sound.	No. If the premises are true and the argument is valid, the conclusion must also be true.	No. If the premises are false, then the argument is not sound.
Valid & unsound	No. If the premises are true and the argument is valid, the argument is sound.	Yes. "Cows are insects. Insects are mammals. So cows are mammals."	No. If the premises are true and the argument is valid, the conclusion must also be true.	Yes. "Cows are insects. Insects are viruses. So cows are viruses."
Invalid & sound	No. By definition a sound argument has to be valid.	No. By definition a sound argument has to be valid.	No. By definition a sound argument has to be valid.	No. By definition a sound argument has to be valid.
Invalid & unsound	Yes. "Cows are mammals. So the sun is larger than the moon."	Yes. "Cows are insects. So the sun is larger than the moon."	Yes. "Cows are mammals. So the moon is larger than the sun."	Yes. "Cows are insects. So the moon is larger than the sun."

Question 2. Are the following statements true or false? Why?

1. All invalid arguments are unsound.

Answer: This is true by definition; sound arguments have to be valid.

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2. All true statements are valid.

Answer: This is false. Only arguments can be valid.

3. To show that an argument is unsound, we must at least show that some of its premises are actually false.

Answer: This is false. If it is invalid, then it is not sound. We can show that an argument is invalid without showing that some of the premises are actually false.

4. An invalid argument must have a false conclusion.

Answer: This is false. If an argument is invalid, then the conclusion need not be true if all of the argument's premises are true. However, this does not mean the conclusion may not be true. For example, "Jack loves Jill; therefore, Jill loves Jack" is an invalid argument even if, as a matter of fact, Jill loves Jack.

5. If all the premises of a valid argument are false, then the conclusion must also be false.

Answer: This is false. If the argument is valid, the conclusion will be true if all of the premises are true. However, this does not mean that the conclusion must be false if all of the premises are false. For example, "The moon is a star, and all stars orbit Earth; therefore, the moon orbits Earth" is a valid argument, even though each premise is false and the conclusion is true.

6. If all the premises and the conclusion of an argument are true, then the argument is valid.

Answer: False. It can still be invalid.

7. All sound arguments are true.

Answer: This is false. What are true or false are statements, not arguments.

8. Any valid argument with a true conclusion is sound.

Answer: This is false. A valid argument with a true conclusion is not necessarily sound.