

CHAPTER 1

Highlight the phrase which expresses the conclusion of each of these arguments:

- ~~1. It is sunny. So I should take my sunglasses.~~
2. It must have been sunny. I did wear my sunglasses, after all.

CHAPTER 1

Highlight the phrase which expresses the conclusion of each of these arguments:

4. Miss Scarlett and Professor Plum were in the study at the time of the murder. And Reverend Green had the candlestick in the ballroom, and we know that there is no blood on his hands. Hence Colonel Mustard did it in the kitchen with the lead-piping. Recall, after all, that the gun had not been fired.

CHAPTER 2

A. Which of the following arguments is valid? Which is invalid?

1. Socrates is a man.
2. All men are carrots.
- ∴ Socrates is a carrot. Valid

1. Abe Lincoln was either born in Illinois or he was once president.
2. Abe Lincoln was never president.
- ∴ Abe Lincoln was born in Illinois. Valid

1. If I pull the trigger, Abe Lincoln will die.
2. I do not pull the trigger.
- ∴ Abe Lincoln will not die. Invalid
Abe Lincoln might die for some other reason: someone else might pull the trigger; he might die of old age.

1. Abe Lincoln was either from France or from Luxemborg.
2. Abe Lincoln was not from Luxemborg.
- ∴ Abe Lincoln was from France. Valid

1. If the world were to end today, then I would not need to get up tomorrow morning.
2. I will need to get up tomorrow morning.
- ∴ The world will not end today. Valid

CHAPTER 2. VALID ARGUMENTS

3

1. Joe is now 19 years old.
2. Joe is now 87 years old.
- ∴ Bob is now 20 years old. Valid

An argument is valid if and only if it is impossible for all the premises to be true and the conclusion false. It is impossible for all the premises to be true; so it is certainly impossible that the premises are all true and the conclusion is false.

B. Could there be:

1. A valid argument that has one false premise and one true premise? Yes.
Example: the first argument, above.
2. A valid argument that has only false premises? Yes.
Example: Socrates is a frog, all frogs are excellent pianists, therefore Socrates is an excellent pianist.
3. A valid argument with only false premises and a false conclusion? Yes.
The same example will suffice.
4. An invalid argument that can be made valid by the addition of a new premise? Yes.
Plenty of examples, but let me offer a more general observation. We can *always* make an invalid argument valid, by adding a contradiction into the premises. For an argument is valid if and only if it is impossible for all the premises to be true and the conclusion false. If the premises are contradictory, then it is impossible for them all to be true (and the conclusion false).
5. A valid argument that can be made invalid by the addition of a new premise? No.
An argument is valid if and only if it is impossible for all the premises to be true and the conclusion false. Adding another premise will only make it harder for the premises all to be true together.

In each case: if so, give an example; if not, explain why not.

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| Elephants dissolve in water.
If you put an elephant in water, it will disintegrate. | NECESSARILY
EQUIVALENT |
| 2. All mammals dissolve in water.
If you put an elephant in water, it will disintegrate. | NOT NECESSARILY
EQUIVALENT |
| 3. George Bush was the 43rd president.
Barack Obama is the 44th president. | NOT NECESSARILY
EQUIVALENT |
| 4. Barack Obama is the 44th president.
Barack Obama was president immediately after the 43rd president. | NECESSARILY
EQUIVALENT |
| 5. Elephants dissolve in water.
All mammals dissolve in water. | NOT NECESSARILY
EQUIVALENT |

E. Consider the following sentences:

- G₁ There are at least four giraffes at the wild animal park.
 G₂ There are exactly seven gorillas at the wild animal park.
 G₃ There are not more than two Martians at the wild animal park.
 G₄ Every giraffe at the wild animal park is a Martian.

Now consider each of the following collections of sentences. Which are jointly possible? Which are jointly impossible?

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|---|--------------------|
| 1. Sentences G ₂ , G ₃ , and G ₄ | Jointly possible |
| 2. Sentences G ₁ , G ₃ , and G ₄ | Jointly impossible |
| 3. Sentences G ₁ , G ₂ , and G ₄ | Jointly possible |
| 4. Sentences G ₁ , G ₂ , and G ₃ | Jointly possible |