

**Worksheet Exercise 1.1.**

Name \_\_\_\_\_

Logic questions

Class \_\_\_\_\_ Date \_\_\_\_\_

**Study questions.** These questions do not have easy answers. (But that doesn't mean that they have no answers.) Just think about these issues. There is no particular order here. Start where you like.

1. Will the study of logic make you more logical?
  
2. What are some advantages of making things formal (symbolic)?
  
3. What are some disadvantages of making things formal (symbolic)?
  
4. Is it true that logic is the most important study there can be for the purpose of attaining truth?
  
5. True or false? "Some things are settled issues. So, further arguments about them are pointless."
  
6. Is it true that people have an intellectual obligation to evaluate all arguments related to their beliefs?
  
7. True or false? "If there is a completely correct argument for a position, then it is true."
  
8. True or false? "If there is a completely correct argument for a position, then all right-thinking people will accept that position."

**Worksheet Exercise 1.2.A.**

Name \_\_\_\_\_

## Detecting Arguments

Class \_\_\_\_\_ Date \_\_\_\_\_

**Part A.** As you read the following passages, interpret each one in the ordinary way. For each passage, determine whether or not it is an argument. If it not an argument, write "not an argument" in the first blank. If it is an argument, then write the premisses and conclusion of the argument (you may shorten them) in the blanks provided. For this exercise, do not try to add any missing parts.

- |  |   |
|--|---|
| 1. If you lie to a parrot, it will bite you. George has never lied to his parrot. So, his parrot has never bitten him. | prem: <u>If you lie to a parrot, it will bite you.</u><br>prem: <u>George has never lied to his parrot.</u><br>concl: <u>His parrot has never bitten him.</u> |
| 2. Earth worms are not carnivorous, because carnivores have teeth, and no earth worms do.                              | prem: _____<br>prem: _____<br>concl: _____  |
| 3. Dogs always like bones. Susan's dog will therefore like these items I have brought. They are bones.                 | prem: _____<br>prem: _____<br>concl: _____  |
| 4. Dogs always like bones. I have brought some items to Susan. They are bones.   | prem: _____<br>prem: _____<br>concl: _____  |
| 5. Your Honor, the traffic light was not red when I went through it. Please believe me. I am telling the truth.        | prem: _____<br>prem: _____<br>concl: _____  |
| 6. You have a good deal here. The item is not too expensive, and you can make good use of it.                          | prem: _____<br>prem: _____<br>concl: _____  |
| 7. If inflation increases, then the price of gold will increase too. We have observed this matter.                     | prem: _____<br>prem: _____<br>concl: _____  |
| 8. Since inflation is increasing, the price of gold is increasing too. We have observed this matter.                   | prem: _____<br>prem: _____<br>concl: _____  |
| 9. The lecture was very boring. Everybody fell asleep. No one listened to anything that was said.                      | prem: _____<br>prem: _____<br>concl: _____  |
| 10. Everybody fell asleep. No one listened to anything that was said. So, it's fair to say the lecture was boring.     | prem: _____<br>prem: _____<br>concl: _____  |

**Worksheet Exercise 1.2.B.**

Name \_\_\_\_\_

Detecting Arguments

Class \_\_\_\_\_ Date \_\_\_\_\_

**Part B.** These are all arguments, and they are more difficult. Identify the premisses and the conclusion (you may shorten them). For this exercise, do not try to add any missing parts, unless the problem requests it. Any extra premiss blanks should be left empty.

(1) That is definitely not my book. My book had my name on it, and that book does not, and that wouldn't be so if it were my book.

prem: \_\_\_\_\_  
prem: \_\_\_\_\_  
prem: \_\_\_\_\_  
prem: \_\_\_\_\_  
concl: \_\_\_\_\_

(2) Since people should learn logic, they should learn the basics and learn logic, because if they don't learn the basics, then they won't learn logic and won't learn the basics. Logic is so important.

prem: \_\_\_\_\_  
prem: \_\_\_\_\_  
prem: \_\_\_\_\_  
prem: \_\_\_\_\_  
concl: \_\_\_\_\_

(3) This position on human nature is impossible, because this position is based on the idea that people can never be trusted. And yet, it claims that on rare occasions certain people can be trusted. But there is no way to reconcile these two points, and that's why this position is impossible.

prem: \_\_\_\_\_  
prem: \_\_\_\_\_  
prem: \_\_\_\_\_  
prem: \_\_\_\_\_  
concl: \_\_\_\_\_

(4) Life is short. [Supply what is missing.]

prem: \_\_\_\_\_  
prem: \_\_\_\_\_  
concl: \_\_\_\_\_

(5) Since our candidate has a commanding lead in the polls, and in as much as her opponent advocates unpopular views, she will surely win the election. And no one can minimize her considerable administrative experience. No one can lose with advantages like that.

prem: \_\_\_\_\_  
prem: \_\_\_\_\_  
prem: \_\_\_\_\_  
prem: \_\_\_\_\_  
concl: \_\_\_\_\_

(6) Liz really wants to meet Bill. And we know she is not shy. So, I think she is coming to the party, because she said that she was free then, and she also knows that Bill will be there. After all, people generally do what they want to do, if they are in a position to do it. She'll be there. You can rely on it.

prem: \_\_\_\_\_

prem: \_\_\_\_\_

prem: \_\_\_\_\_

prem: \_\_\_\_\_

prem: \_\_\_\_\_

concl: \_\_\_\_\_

(7) It may appear that people's minds are sometimes completely inactive, but it must be true that our minds are really always active. Otherwise, it would be impossible for an alarm to waken us from such inactivity. But, as we all know, alarms do actually work. (Don't forget to set your alarm clock.)

prem: \_\_\_\_\_

prem: \_\_\_\_\_

prem: \_\_\_\_\_

prem: \_\_\_\_\_

concl: \_\_\_\_\_

(8) Since Bill went to the party in order to meet Liz, and given that the party was a small one, Liz will certainly meet Bill if she goes there, because two people in those circumstances will meet each other, if they want to, and Liz does.

prem: \_\_\_\_\_

prem: \_\_\_\_\_

prem: \_\_\_\_\_

prem: \_\_\_\_\_

concl: \_\_\_\_\_

(9) You have to watch out for sneak attacks, They will make them, you can count on that. They agreed to have an open debate, but instead they only attacked us. You see, it's true.

prem: \_\_\_\_\_

prem: \_\_\_\_\_

prem: \_\_\_\_\_

concl: \_\_\_\_\_

(10) The bigger the burger, the better the burger. The burgers are bigger at Burger Barn. [Supply what is missing.]

prem: \_\_\_\_\_

prem: \_\_\_\_\_

prem: \_\_\_\_\_

concl: \_\_\_\_\_

**Worksheet Exercise 1.3.**

## Evaluating Arguments

Name \_\_\_\_\_

Class \_\_\_\_\_ Date \_\_\_\_\_

**Instructions.** Write the following arguments as abstract patterns. Use the obvious capital letters to abbreviate the regional groups. Also, for purposes of this exercise, let us stipulate that a person is said to be member of a certain regional group just in case that person was born in the specified region, e.g., an Italian is only someone who was born in Italy. Then, answer the three questions with yes or no.

Question 1. Is the argument valid? (Base this on the pattern used)Question 2. Are all of the premisses true? (Base this on the real world)

Question 3. Is the argument sound? (Base this on Q.1 and Q.2)

- |   |  |  |
|---|--|--|
| 0. All Athenians are Europeans.<br>All Greeks are Europeans.<br>So, all Athenians are Greeks.       | 1. <u>all A are E</u><br>2. <u>all G are E</u><br>so, <u>all A are G</u> | Is the arg valid? <u>no</u><br>Are all prems true? <u>yes</u><br>Is the arg sound? <u>no</u> |
| 1. All Romans are Italians.<br>All Italians are Europeans.<br>So, all Romans are Europeans.         | 1. _____<br>2. _____<br>so, _____  | Is the arg valid? _____<br>Are all prems true? _____<br>Is the arg sound? _____              |
| 2. All Greeks are Russians.<br>All Russians are Spaniards.<br>So, all Greeks are Spaniards.         | 1. _____<br>2. _____<br>so, _____  | Is the arg valid? _____<br>Are all prems true? _____<br>Is the arg sound? _____              |
| 3. All Hollanders are Greeks.<br>All Europeans are Greeks.<br>So, all Hollanders are Europeans.     | 1. _____<br>2. _____<br>so, _____  | Is the arg valid? _____<br>Are all prems true? _____<br>Is the arg sound? _____              |
| 4. All Egyptians are Africans.<br>All Chinese are Africans.<br>So, all Chinese are Egyptians.       | 1. _____<br>2. _____<br>so, _____  | Is the arg valid? _____<br>Are all prems true? _____<br>Is the arg sound? _____              |
| 5. All Egyptians are Chinese.<br>All Chinese are Africans.<br>So, all Egyptians are Africans.       | 1. _____<br>2. _____<br>so, _____  | Is the arg valid? _____<br>Are all prems true? _____<br>Is the arg sound? _____              |
| 6. All Moscovites are Russians.<br>All Moscovites are Europeans.<br>So, all Europeans are Russians. | 1. _____<br>2. _____<br>so, _____  | Is the arg valid? _____<br>Are all prems true? _____<br>Is the arg sound? _____              |
| 7. All Londoners are Britains<br>No Britains are Russians.<br>So, no Londoners are Russians.        | 1. _____<br>2. _____<br>so, _____  | Is the arg valid? _____<br>Are all prems true? _____<br>Is the arg sound? _____              |
| 8. No Greeks are Russians.<br>No Athenians are Russians.<br>So, no Greeks are Athenians.            | 1. _____<br>2. _____<br>so, _____  | Is the arg valid? _____<br>Are all prems true? _____<br>Is the arg sound? _____              |

**Worksheet Exercise 1.4.A.**

Name \_\_\_\_\_

## Classifying Sentences

Class \_\_\_\_\_ Date \_\_\_\_\_

**Part A.** Classify each of the following sentences as being one of the following: necessarily true (nec. T), necessarily false (nec. F), empirically true (emp. T), empirically false (emp. F). Please use the abbreviated labels. Interpret these sentences according to their ordinary meaning.

- \_\_\_\_\_ 1. The Earth is round.
- \_\_\_\_\_ 2. The Earth is flat.
- \_\_\_\_\_ 3. All cats are animals.
- \_\_\_\_\_ 4. All cats have tails.
- \_\_\_\_\_ 5. There are people that live on the Moon.
- \_\_\_\_\_ 6. There are people that own round cubes.
- \_\_\_\_\_ 7. Wherever you go, you are there.
- \_\_\_\_\_ 8. Past events occur at some time before the present.
- \_\_\_\_\_ 9. Every banana on the Moon is located on the Moon.
- \_\_\_\_\_ 10. Loyola U. Chicago is the world's largest university.
- \_\_\_\_\_ 11. One pear, one peach, and one plum add to six fruits.
- \_\_\_\_\_ 12. Either all cats have green tails, or some cats do not.
- \_\_\_\_\_ 13. TV's did not exist before the 20th century.
- \_\_\_\_\_ 14. Boiling water (212°F) causes damage to human skin.
- \_\_\_\_\_ 15. Every cube has 8 corners, 12 edges, and 6 faces.
- \_\_\_\_\_ 16. A figure's perimeter is longer than any of its diagonals.
- \_\_\_\_\_ 17. Cows moo.
- \_\_\_\_\_ 18. Water is composed of oxygen and hydrogen.
- \_\_\_\_\_ 19. There are lakes of water on the Moon.
- \_\_\_\_\_ 20. All bachelors who are married are unmarried.

**Worksheet Exercise 1.4.B.**

Name \_\_\_\_\_

Args. with classified sentences

Class \_\_\_\_\_ Date \_\_\_\_\_

**Part B.** Give an example of each of the following kinds of arguments. You don't have to make these examples fascinating arguments. Silly ones will do. Each of these arguments has two premisses. Start with a valid or invalid abstract pattern in the blanks on the left, and then fill in the blanks towards the right with matching English sentences.

0. An invalid argument with all the premisses and conclusion empirically false.

prem: Some P are B      Some persons are banana-shaped things

prem: All B are G      All banana-shaped things are residents of Chicago

concl: All P are G      All persons are residents of Chicago

1. A valid argument with all the premisses and conclusion empirically false.

prem: \_\_\_\_\_

prem: \_\_\_\_\_

concl: \_\_\_\_\_

2. A valid argument with all the premisses and conclusion empirically true.

prem: \_\_\_\_\_

prem: \_\_\_\_\_

concl: \_\_\_\_\_

3. A valid argument with all the premisses false and the conclusion true.

prem: \_\_\_\_\_

prem: \_\_\_\_\_

concl: \_\_\_\_\_

4. A valid argument with all the premisses and conclusion necessarily true.

prem: \_\_\_\_\_

prem: \_\_\_\_\_

concl: \_\_\_\_\_

5. A valid argument with one of the premisses necessarily false.

prem: \_\_\_\_\_

prem: \_\_\_\_\_

concl: \_\_\_\_\_

6. A valid argument with the conclusion necessarily false.

prem: \_\_\_\_\_

prem: \_\_\_\_\_

concl: \_\_\_\_\_

7. A valid argument with necessarily true premisses and a possibly false conclusion.

    This is an impossible combination. Reflect on this.

\_\_\_\_\_

**Worksheet Exercise 1.5.**

Name \_\_\_\_\_

Review of Terms

Class \_\_\_\_\_ Date \_\_\_\_\_

**Part A.** Determine whether the following assertions are true or false (use **T** or **F**). Remember, when these assertions talk of true or false premisses or conclusions that means premisses and conclusions that are true or false in the real world.

- \_\_\_ 1. All valid arguments have a correct connection.
- \_\_\_ 2. All valid arguments have only true premisses.
- \_\_\_ 3. All valid arguments have a true conclusion.
- \_\_\_ 4. All invalid arguments do not have a correct connection.
- \_\_\_ 5. All invalid arguments have some false premisses.
- \_\_\_ 6. All invalid arguments have a false conclusion.
- \_\_\_ 7. All sound arguments are valid.
- \_\_\_ 8. All sound arguments have only true premisses.
- \_\_\_ 9. All sound arguments have a true conclusion.
- \_\_\_ 10. All unsound arguments are invalid.
- \_\_\_ 11. All unsound arguments have some false premisses.
- \_\_\_ 12. All unsound arguments have a false conclusion.
- \_\_\_ 13. All proofs are known to be sound.
- \_\_\_ 14. All proofs have true premisses.
- \_\_\_ 15. All proofs are valid.
- \_\_\_ 16. All proofs have a conclusion that is true.
- \_\_\_ 17. All proofs have a conclusion that is a proven truth.
- \_\_\_ 18. All non-proofs are invalid.
- \_\_\_ 19. All non-proofs have some false premisses.
- \_\_\_ 20. All inconclusive arguments are not known to be sound.
- \_\_\_ 21. All inconclusive arguments are not known to be unsound.
- \_\_\_ 22. All inconclusive arguments are not proofs.
- \_\_\_ 23. All inconclusive arguments are invalid
- \_\_\_ 24. All inconclusive arguments have some false premisses.

**Part B.** For your consideration only. You should be able to back up your answers to Part A with examples. Also, if an assertion is false (**F**), consider whether changing the word "all" to "some" would make a difference.

**Worksheet Exercise 1.6.A.**

Name \_\_\_\_\_

## Testing Validity

Class \_\_\_\_\_ Date \_\_\_\_\_

**Part A.** Use the possible world test to determine whether the following arguments are valid. In each test give an itemized description of the relevant items such that: (a) for the invalid arguments, the description must show the premisses to be true and the conclusion to be false, and (b) for the valid arguments, the description must show that having true premisses means that you can't have a false conclusion (annotate "= F?" with "can't"). Use the given capital letters to make the descriptions.

	poss. values	possible world description:					
(1) Argument is <u>invalid</u>							
All Democrats want gun control.	= T ? <u>yes</u>	X1	X2	X3	X4	X5	X6
George wants gun control.	= T ? <u>yes</u>	D	D	D	R	R	R
So, George must be a Democrat.	= F ? <u>yes</u>	C	C	C	F	F	C
							george

(D = Democrat, C = gun control, F = gun freedom, R = Republican)

	poss. values	possible world description:					
(2) Argument is _____							
All ants are blue.	= T ? _____	X1	X2	X3	X4	X5	X6
No blue things are square.	= T ? _____						
So, no ants are square.	= F ? _____						

(A = ant, B = blue, S = square, R = round)

	poss. values	possible world description:					
(3) Argument is _____							
All Democrats want gun control.	= T ? _____	X1	X2	X3	X4	X5	X6
George is not a Democrat.	= T ? _____						
So, he doesn't want gun control.	= F ? _____						

(D = Democrat, C = gun control, F = gun freedom, R = Republican)

	poss. values	possible world description:					
(4) Argument is _____							
No ants are blue.	= T ? _____	X1	X2	X3	X4	X5	X6
All blue things are square.	= T ? _____						
So, no ants are square.	= F ? _____						

(A = ant, B = blue, S = square, G = green)

	poss. values	possible world description:					
(5) Argument is _____							
Some ants are round.	= T ? _____	X1	X2	X3	X4	X5	X6
Some ants are blue.	= T ? _____						
So, some round things are blue.	= F ? _____						

(A = ant, R = round, B = blue, S = square, G = green)

	poss. values	possible world description:					
(6) Argument is _____							
No Democrats are bald.	= T ? _____	X1	X2	X3	X4	X5	X6
Some Democrats are tall.	= T ? _____						
So, some tall things are not bald.	= F ? _____						

(D = Democrat, B = bald, T = tall, H = has hair, R = Republican, S = short)

**Worksheet Exercise 1.6.B.**

Name \_\_\_\_\_

**Cogent Arguments**

Class \_\_\_\_\_ Date \_\_\_\_\_

**Part B.** The following are all inductive arguments. Determine whether these arguments are cogent arguments by answering the three indicated questions with yes or no.

Question 1. Are all the premisses true? (Use your best judgment.)

Question 2. Is the inductive connection a strong one? (Use your best judgment.)

Question 3. Is the argument cogent? (base this on Q.1 and Q.2)

- |   |  |
|---|--|
| 1. College tuition is much more expensive now than two generations ago. So, fewer students are able to attend college now than two generations ago.   | Are all prems true? _____<br>Is connection strong? _____<br>Is the arg cogent? _____ |
| 2. Most college students today have a strong sense of social responsibility. Most people think that Senator Obama has a platform that represents social responsibility and that the Sen. McCain has a platform that represents national security. People generally vote for candidates that agree with their view of things. So, most college students today will vote for Senator Obama. | Are all prems true? _____<br>Is connection strong? _____<br>Is the arg cogent? _____ |
| 3. Despite some gloomy prospects, the younger generation still seeks the American Dream, and they realize that achieving it will be more difficult than it was for the previous generations. But they also have a hopeful outlook about the possibility of their own success. So, the younger generation will succeed in achieving the American Dream.                                    | Are all prems true? _____<br>Is connection strong? _____<br>Is the arg cogent? _____ |
| 4. Many people nowadays are aware of the various health hazards that exist in their everyday lives, such as cigarette smoking, substance abuse, processed foods, environmental pollution, lack of exercise, and they also know how best to avoid such hazards and have changed their lives accordingly. So, these people will enjoy healthier lives.                                      | Are all prems true? _____<br>Is connection strong? _____<br>Is the arg cogent? _____ |
| 5. Some people have jobs that actually require them to meet specific goals, and if they do not meet those goals, they will lose their jobs. One of your friends has a job with specific performance expectations. So, your friend will lose his job, if he does not meet those expectations.  | Are all prems true? _____<br>Is connection strong? _____<br>Is the arg cogent? _____ |
| 6. When people begin to consider their retirement, they usually worry more about the market performance of their retirement funds. Some of your acquaintances have mentioned their concern about the poor performance of the stock market. So, they are probably thinking about retiring soon.  | Are all prems true? _____<br>Is connection strong? _____<br>Is the arg cogent? _____ |

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7. Americans now find European vacations to be very expensive, because the price of everything in euros when converted to dollars costs much more than in the U.S. A number of American families are planning vacations in Europe next year. So, they must be expecting that the value of the euro will go down substantially against the dollar next year.
- Are all prems true? \_\_\_\_\_  
Is connection strong? \_\_\_\_\_  
Is the arg cogent? \_\_\_\_\_
8. Most people are confident about their present state of health, and yet, they buy health insurance, if they are able to do so. Now, people wouldn't do that, if they didn't think that they needed health insurance. So, while most people think that they will not actually undergo costly medical procedures in the near future, most people do think that this is a real possibility.
- Are all prems true? \_\_\_\_\_  
Is connection strong? \_\_\_\_\_  
Is the arg cogent? \_\_\_\_\_