

# Introduction to Logical Reasoning

## Problem Set #13: Assessing Categorical Syllogisms

Although I strongly suggest that you write out answers to all these problems, you do *not* have to turn in any written responses. You do, however, need to be prepared to do these types of problems, for questions on the weekly quizzes and exams will primarily be drawn from the problem sets. The solutions to these problems will be provided, so you can check your own work and seek help from me as necessary.

We will devote considerable time to these types of problems during the next in-class workshop. In order to make that workshop productive, please make a solid start on them. That way you can use the workshop to address the difficulties you are facing.

If you do the extra credit logic puzzle, you must email me your solution by Sunday, December 1<sup>st</sup> at 12:00PM (noon). Late extra credit will not be considered, no exceptions.

### Instructions

Each of the following problems presents a categorical syllogism. For each of these syllogisms: (1) identify the major term (*P*), the minor term (*S*), and the middle term (*M*); (2) put the syllogism into standard symbolic form; (3) state the formal identification of the syllogism's form; and (4) use Venn diagrams of the premises and the conclusion to determine whether the syllogism is valid or invalid.

### Problems

1. No nuclear-powered submarines are commercial vessels, so no warships are commercial vessels, because all nuclear-powered submarines are warships.
2. Some evergreens are objects of worship, because all fir trees are evergreens, and some objects of worship are fir trees.
3. All artificial satellites are important scientific achievements; therefore some important scientific achievements are not U.S. inventions, inasmuch as some artificial satellites are not U.S. inventions.
4. No television stars are certified public accountants, but all certified public accountants are people of good business sense; it follows that no television stars are people of good business sense.
5. Some conservatives are not advocates of high tariff rates, because all advocates of high tariff rates are Republicans, and some Republicans are not conservatives.
6. All CD players are delicate mechanisms, but no delicate mechanisms are suitable toys for children; consequently, no CD players are suitable toys for children.
7. All juvenile delinquents are maladjusted individuals, and some juvenile delinquents are products of broken homes; hence some maladjusted individuals are products of broken homes.
8. No stubborn individuals who never admit a mistake are good teachers, so, because some well-informed people are stubborn individuals who never admit a mistake, some good teachers are not well-informed people.
9. All proteins are organic compounds, hence all enzymes are proteins, as all enzymes are organic compounds.
10. No sports cars are vehicles intended to be driven at moderate speeds, but all automobiles designed for family use are vehicles intended to be driven at moderate speeds, from which it follows that no sports cars are automobiles designed for family use.
11. No apples are vegetables. Some plants are vegetables. So some plants are not apples.
12. All horses are mammals, and no mammals are lizards. Therefore, no lizards are horses.
13. All cars are self-propelled vehicles, and all motorcycles are self-propelled vehicles. Thus, all motorcycles are cars.
14. Some roses are yellow flowers. All roses are plants. Therefore, some plants are yellow flowers.
15. All roads are highways to Rome, but no mere paths are roads. So no mere paths are highways to Rome.
16. Some videotapes are not film classics, but all black-and-white movies are film classics. Therefore, some black-and-white movies are not videotapes.
17. All presidents are leaders, but some statesmen are not presidents. So some statesmen are not leaders.
18. All politicians are campaigners. All campaigners are money-grubbers. Therefore all politicians are money-grubbers.
19. No elm trees are cacti. Some tall plants are elm trees. So some tall plants are not cacti.
20. All thieves are criminals. All thieves are dangers to society. Therefore, all dangers to society are criminals.
21. Some architectural structures are nontraditional designs, for all houses are architectural structures, and some houses are nontraditional designs.
22. All bacon burgers are heart attack-inducing foods because all bacon burgers are high-fat foods, and some heart attack-inducing foods are not high-fat foods.
23. All worshippers of God are spiritual giants because all worshippers of God are redeemed souls, and all redeemed souls are spiritual giants.
24. Some famous men are not racists since all racists are enemies of justice, and some famous men are not enemies of justice.
25. No persons who are true to the values of this republic are politicians because all politicians are self-promoting egoists. And no self-promoting egoists are persons true to the values of this republic.
26. Some philosophers are musicians. Therefore, some trumpet players are philosophers since all trumpet players are musicians.
27. All opponents of the United States going to war against terrorist states are people opposed to anti-terrorist security arrangements. Some people opposed to anti-terrorist security arrangements are Leftist extremists. Therefore, some opponents of the United States going to war against terrorist states are not Leftist extremists.

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28. No wimps are social activists because no wimps are people of honest and strong conviction. And all social activists are people of honest and strong conviction.
29. Most people who drive SUVs (sport utility vehicles) are instant-gratification freaks who don't care about the environment or environmental issues. Instant-gratification freaks who don't care about the environment or environmental issues are the true enemies of the planet. Therefore, people who drive SUVs are the true enemies of the planet.
30. Vitamin pills are useless gimmicks promoted as sure-cures for a variety of illnesses. Some useless gimmicks promoted as sure-cures, though, are placebos that can make people feel good. So some vitamin pills are placebos that can make people feel good even if they don't cure anything.

**Note:** There may a lot of exercises here. Do not feel obligated to do all of them. I often assign many exercises so that you have plenty of opportunities to practice the skills these exercises are trying to impart. I suggest doing just enough of them so that you are confident that you could use these skills on a quiz or an exam.

### Extra Credit Logic Puzzle

The body of Austin Powers, international man of mystery, was found floating in the Arabic Gulf, two miles from Doha, Qatar, at 3:30AM on December 18 of last year. The cause was death by man eating sharks equipped with lasers on their heads. After considerable effort on the part of Interpol, five suspects—one of whom *is* guilty—were brought before the lead detective of Scotland Yard, who asked them what they had to say for themselves. Each suspect made four statements, exactly three of which are true and exactly one of which is false. Their statements were:

**Dr. Evil:** I was in Dukhan when Powers was murdered. I never killed anyone. The Frau is the guilty one. Number Two and I are pals.

**Number Two:** I did not kill Powers. The Frau has never been in Doha. I never saw Dr. Evil before. Fat Man was in Al-Khor with me on the night of December 18.

**Mini Me:** Fat Man is lying when he says he never owned any man-eating sharks. The murder was committed on Qatar's National Day. Dr. Evil was in Dukhan at this time. One of us is guilty.

**Fat Man:** I did not kill Powers. I never owned any man-eating sharks in my life. The Frau knows me. I was in Al-Khor the night of December 18.

**The Frau:** I did not kill Powers. I have never been in Doha. I never saw Fat Man before. Dr. Evil erred when he said I am guilty.

**Question:** Who murdered Austin Powers?

To receive full credit you must justify your answer with a logical argument showing why you are 100% right. That is to say, this question has a definitive answer that can be justified without *any* guessing on your part.