A deductive argument can be refuted (i.e., shown to be invalid, hence unsound) by stating a second argument that has all three of the following features:

1. the same form as the first argument;
2. true premises; and
3. a false conclusion.

This is called “refutation by logical analogy” because the arguments have analogous (similar) forms.3

What is the rationale for this procedure? The first thing to understand is that validity is a formal or structural property of an argument. To say that an argument is valid is to say nothing about whether its constituent propositions are true. What it says is that if the premises are true, then the conclusion is true. A valid argument is such that it is impossible for its premise(s) to be true while its conclusion is false. Validity is a relation between premise(s) and conclusion, not a property of premise(s) or conclusion. A valid argument is one that preserves truth. We value validity because—and only because—we value truth. It is a means to our end.

Since validity concerns only the form of an argument, if two arguments have the same form and one of them is invalid, then the other is invalid as well. (In other words, two arguments with the same form are either both valid or both invalid.) Suppose we are wondering whether a particular argument, X, is valid. One way to find out (and here I repeat what I said earlier) is to try to construct another argument of the same form as X that has true premises and a false conclusion. Suppose we manage to do this. Then, given the definition of “valid argument,” we may infer that the second (constructed) argument is invalid, for (by definition) no valid argument has true premises and a false conclusion. But if the second argument is invalid, and if the second argument has the same form as X, then X is invalid.

Here’s an example. Suppose I wish to refute the argument that, since no conservatives are liberals and all religious people are conservatives, all religious people are liberals. This argument—call

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1 In making a deductive argument (as opposed to an inductive argument), one claims that the conclusion is implicit in, i.e., logically implied by, the premises. One is not merely claiming that the conclusion is probably true, given the premises. That would be an inductive argument.
2 Don’t confuse “refute” (or its variants, such as “refutation”) with “rebut” (or its variants, such as “rebuttal”). The word “refute,” as used by philosophers, means “To disprove. This is a success word; to attempt to disprove something is to argue against it or to reject it, repudiate it, or rebut it, but not yet to refute it.” Simon Blackburn, The Oxford Dictionary of Philosophy, 2nd ed. rev. (New York: Oxford University Press, 2008), 311 (c.v. “refute”). Robert M. Martin defines “refutation” as “The demonstration by means of argument that some position is mistaken. Philosophy students often misuse this word to refer to any attempt to rebut a position: ‘The Church refuted Galileo’s claim that the earth travelled around the sun by appealing to Scripture.’ Something is refuted, properly speaking, only when it is successfully shown to be false.” Robert M. Martin, The Philosopher’s Dictionary, 3d ed. (Peterborough, Ontario: Broadview Press, 2002), 258 (c.v. “refutation”). Think of it this way: “refute” means successfully rebut, while “rebut” means try (or attempt) to refute. The Church rebutted Galileo’s claim; it did not refute it. To refute the claim that the earth travels around the sun is to prove that it does not, and of course the Church did not do that. (Nobody has.)
3 It is also called “the counterexample method of refutation” and “refutation by parallel argument.”
it “A1” — has the following form:

1. No C are L.
2. All R are C.
   Therefore,
3. All R are L.

Let us substitute terms for the letters “C,” “L,” and “R” in such a way as to make 1 and 2 true and 3 false. Here is A2:

4. No triangles are squares.
5. All three-sided figures are triangles.
   Therefore,
6. All three-sided figures are squares.

Premises 4 and 5 are true, but 6 is false. What this shows is that A2 is invalid, for, by definition, no valid argument has true premises and a false conclusion. But if A2 is invalid, and if A2 has the same form as A1, then A1 is invalid. The refutation is complete.

Let us complicate things a bit. Suppose my aim is the ad hominem one of persuading a particular person, S, that his or her argument is invalid, and hence unsound. My strategy will be to construct a second argument that S agrees has:

1. the same form as the first argument;
2. true premises; and
3. a false conclusion.

It may be that S, through pride, stubbornness, or insincerity, refuses to admit this, or wishes to think further about the alleged refutation, so in practice this strategy may not work. But in principle, one can refute arguments in this way.

Caveat: Failure to find (“think up”) an argument that satisfies the three requirements does not prove that the original argument is valid; it may simply reflect one’s lack of creativity in thinking up a refuting analogy. The most one can say about an argument that one has tried but failed to refute is that it is probably valid. The strength of this conclusion (i.e., the degree of probability) is directly proportional to (1) how adept one is at refutations; (2) how long one has tried to refute the argument; and (3) how hard one has tried to refute the argument.

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* Arguments made to a particular person, or to a group of like-minded people, are said to be *ad hominem* (to the person). Do not confuse *ad hominem* argumentation, which is a legitimate argumentative technique, with the *ad hominem* fallacy, which consists in dismissing a person’s argument on the basis of some defect in the person making the argument. In other words, don’t confuse arguing to the person with attacking or abusing the person.